SENIOR EXECUTIVES' ROLE IN THE COMPUTER-BASED INFORMATION SYSTEMS (CBIS) IMPLEMENTATION PROCESS: THE CASE OF MALAYSIAN GOVERNMENT AGENCIES

by

Mokhtar MOHD-YUSOF
Information Systems Research Centre
University of Salford

Submitted for the fulfilment of the degree of

Doctor of Philosophy (Ph. D.)

Supervisor:
Professor A. T. Wood-Harper

Year of Submission:
1996

To

Fatimah,

Faisal,

Zaid,

Soraya,

Nur-Izwani,

the loving memory of my mother,

and

my father

Table of Contents

Table of Figures

Table of Tables

Acknowledgements

In doing this research, I am indebted morally, spiritually and materially to many individuals and organisations who helped me in various ways. It may not be possible to mention all of them here, but their help, support, guidance and contribution are highly appreciated.

First, I would like to thank the Public Service Department (PSD), Malaysia, for sponsoring me for this study. Without a scholarship this research would have proved impossible. My great thanks go to Mr. Abdul Aziz Yusof, Deputy Director of Training, PSD, Malaysia (1992) for his fullest support of my research. My special thanks also go to Dr. Raja Malek Mohamed, Head of National Computer Training Centre, National Institute of Public Administration, Malaysia (INTAN), their officers and staff and to the Director of INTAN who help me throughout my three month's fieldwork.

My highest gratitude is due to Professor A. T. Wood-Harper for his keenest interest in my research and his constant guidance, encouragement, and co-operation without which it would have been impossible for me to complete this study. He took great care in going through all chapters of the thesis and made countless editorial improvements, apart from pointing out weaknesses of my

arguments. His friendly approach, intellectual insights, and meticulous advice have been of help for the success of this research. I have also benefited significantly from discussions with Mr. JRG Wood and from taking part in his lectures.

I am also indebted to Dr. Md. Ishak Desa and Zalila Ali for their many useful comments and guidance concerning the analysis of the quantitative data. My fellow doctoral students, especially Jim Huges and Mark Jones are to be thanked for proof-reading the thesis. I must take the responsibility for the errors that remain.

Finally, I extend my deepest appreciation to my wife, Fatimah and to all of my children (Faisal, Zaid, Soraya, and Nur-Izwani), who have been the constant source of inspiration. Their patience, understanding and sharing of my problems helped to comfort me throughout the research. Without their support, sacrifices and prayers the timely completion of this thesis would have remained impossible.

Abbreviations

CATWOE	Customers, Actors, Transformation, Weltanschauung, Owner & Environment
CBIS	Computer-based Information Systems
CEO	Chief Executive Officer
CSN	Chief Secretary to the Nation
DDG	Deputy Director Generals
DDP	Distributed Data Processing
DP	Data Processing
DF	Degree of Freedom
DG	Director Generals
DSG	Deputy Secretary Generals
EPF	Employees Provident Fund
EPFL	Employment Pass & Foreign Labour
ETHICS	Effective Technical & Human Implementation of Computer-based Systems
HQ	Head Quarters
ID	Immigration Department
IIS	Immigration Information System
INTAN	National Institute of Public Administration
IPSE	Integrated Project Support Environment
IRD	Inland Revenue Department
IS	Information Systems
ISD	Information Systems Development
IT	Information Technology
KPTG	Land & Mines Department
LIS	Land Information System

MAMPU	Malaysian Management Modernisation Unit
MGO	Malaysian Government Organisations
MIMOS	Malaysian Institute of Microelectronics Systems
MIS	Management Information Systems
MLCD	Ministry of Land & Co-operative Development
MNCC	Malaysian National Computer Confederation
MRC	Machine Readable Card
MRP	Material Requirements Planning
NALIS	National Land Information System
NCCIT	National Consultative Committee on IT
NCDP	National Committee on Data Processing
NFPE	Non-Financial Public Enterprises
NITC	National Information Technology Council
NLC	National Land Code
PIKOM	Malaysian Associations of Computer Industry
PM	Prime Minister
PMD	Prime Minister's Department
PMU	Planning & Management Unit
PNB	Permodalan Nasional Berhad
PRT	Policy Research & Training
PSD	Public Service Department
SA	Systems Analyst
SD	Security Division
SDU	Systems Development Unit
SE	Senior Executive
SG	Secretary Generals
SSM	Soft Systems Methodology
TDC	Tourist Development Corporation
TOL	Temporary Occupation Licences

Abstract

Senior executives often infuse their organisations with the values that they have inherited from prior socialisation as well as from their work experience. Because of their role as leaders at a critical juncture in an organisation's development, they are able to model an organisation's culture in unique ways. Thus, their support (or lack of it) will affect the impact of any major structural or procedural change in the existing organisation such as implementing a computer-based information system (CBIS). Yet the focus of most Information Systems Practitioners is mainly towards technical tasks, so that they pay inadequate attention to and are lacking in their appreciation of the social (organisational, cultural, political, and personal) aspects of the senior executive's role.

The objectives of the research are to study and understand the social and technical phenomena that occur within a CBIS's implementation processes. The study seeks to identify the factors that cause these phenomena, their relationships, and the degree to which they influence practices, procedures, and outcomes during CBISs' implementations. The "multiple perspective" framework, adopted in the study, provides a total systems rationale, allowing due scope for both the formal-rational technical approach and the social parameters. It incorporates the multiple (organisational, technical, and personal) perspectives of stakeholders, and multilevel

(context, process, and linkage) perspectives apparent within the processes itself. The research, therefore, focuses on the question, "What is going on in the CBIS implementation process?" rather than on the question "How should it be implemented?"

Research data were collected using empirical research methods based on an exploratory pilot study through survey questionnaires and two in-depth case studies of Malaysian government organisations. A framework using the Multiview methodology is proposed to enhance the analysis of the role of senior executives in the CBIS implementation process. The study concludes that CBIS implementation can neither be understood nor undertaken independently of the multiple perspectives of its stakeholders and multilevel processes that affect its implementation, use, and development.

1 Introduction

This chapter discusses the issues that gave rise to the research work itself. The issues are stated as a problem situation. Propositions were established and tested, and conclusions drawn. An overview is given of the research arguments, assumptions and limitations of the work. A summary navigational guide to the structure and presentation of the research work, is given that parallels the discussion.

1.1 Background

A rapid increase in the proliferation of technological innovations in organisations has been witnessed in the past few years. There are many factors associated with the increased interest in information technology (IT), among which are the following:

- the growing number of people working in the information sector
- escalating office costs
- complexity and turbulence in the business environment

- advances in technology and decline in equipment costs
- competitive pressures
- new opportunities for enhancing productivity and gaining a competitive edge.

A significant drop in the size and cost of computer hardware came with the appearance of the microprocessor, which was considered a revolutionary development. Faster and easier access to information, and computing power in general as a result of the incorporation of computer-based information systems (CBIS) brought many people into more direct contact with IT.

IT and information systems[1] (IS) or CBIS are now two major concerns in any organisation. A steady flow of literature in recent times provides evidence of the need to improve effectiveness and competitiveness. Organisations vary in their capability to absorb IT. Management practitioners and researchers help the organisation to realise in practice the growing potential contribution of IT/ CBIS. This is reflected in the growing literature in the subject, as it deals with frameworks, approaches, planning methodologies, project management techniques, and organisational experiences directed towards helping potential users to understand the implications of the explosive growth in the field of IT and to exploit it to achieve their goals and objectives.

1.2 Research Problems and Related Issues

Many difficulties are being encountered by both the public and private sectors in Malaysia in implementing CBIS projects. "IT" is being looked at by the government agencies as a solution to such problems as the pressures of increasing costs, budgeting and personnel constraints. This IT appears to offer the prospect of improved

[1] In this thesis, the terms information systems (IS) and computer-based information systems (CBIS) are used interchangeably.

performance and the availability of office technology. With IT interests growing on the one hand, there has been little concern about what kinds of defect exist in present systems and what has caused them. IS are not usually co-ordinated into management needs on an organisation-wide scale in Malaysian government organisations (Mohamed, 1990). The impact of IT and its potential, the shortage of expertise, the low quality of training, conflicts of interest and power, and the absences of guiding mechanisms are areas which still need to be understood fully. This has made the introduction of new technology a chaotic business with either limited or very few productivity benefits and has made difficult the integration of IT and its further development. The government organisations' image is thus one of inefficient information management. Developing new applications has proved to be slow and to involve many reservations. Consequently, new CBIS have not become useful tools for improving organisational and individual effectiveness.

According to Kaddah (1990), the new technology (e.g. IT), has not in many cases lived up to the high expectations that were held for its use. System implementation failure has often been the result of over-focusing on the technology to the exclusion of other, human, social, and organisational aspects associated with technological change. Excellence in technical design alone did not guarantee system success (Baronass & Louis, 1988). One of the major obstacles impeding the effective implementation of CBIS is human adjustment to new technology and to change. Adjustment problems are experienced by management and IS practitioners in accepting and working with new equipment, adapting to new organisational and human relationships, and assimilating new procedures (Matherly & Matherly, 1985).

According to Peterson and Peterson (1986), CBIS can transform the ways that people and organisations work and result in far-reaching social and organisational changes. Such changes have aroused feelings of uncertainty and anxiety, which have led many users to resist the introduction of new technology. Furthermore, Keen (1984)

noted the lack of technological understanding among managers, which has resulted in a "blurred and ambiguous picture of the future that CBIS is intended to help to create." According to Evans (1983) and Hirschheim (1985a), CBIS may cause a redistribution of resources, which is perceived as a threat to individuals and their various interest groups. Adjustments to reward schemes, changes in authority or responsibility patterns, or shifting power centres are a requirement for the successful implementation of CBIS (Rockart, 1988).

In *The Corporation of the 1990s*, expert opinions are provided on how IT will influence organisations and their ability to compete in the 1990s and beyond (Morton, 1991). According to McKersie and Walton (1991), implementation of the technology is a key challenge that organisations face concerning IT. More attention is actually directed towards the technical aspects of the new system, while insufficient attention is directed to the behavioural and organisational aspects of technological change whenever technological change is introduced in an organisation (Counte *et al.* 1985; Morgan, 1992). The outcome of this is that the new technology does not live up to the expectations as managers fail to "make sufficient changes in individual and organisational habits to obtain the business benefits" for which they planned (Falkenstine, 1991, p. 80). As Rockart (1988, p. 11) notes, "If they are to be operated effectively, today's systems... almost always require major, sometimes radical, alterations in organisation's structure, personnel, roles, and business processes - sometimes even in the culture of the corporation itself."

According to a survey finding by Lee (1986) and also according to Danziger and Kraemer (1985, 1986), policy-makers and managers are less extensive users of computing than all other categories of end-users. In general, there is minimal involvement at the top of the organisation hierarchy (policy-makers and managers). Danziger and Kraemer (1986) found that CBIS relevant to the senior executives' functional needs and to their needs for managerial control in particular, are either non-

existent or not useful. Drucker (1995) argues that the greatest contribution of data processing capacity so far has not been to management but to operation. Barlett and Ghosal (1995) reveal that for top management, data processing systems are neither the most important nor the most effective means of collecting, evaluating, and transporting information, since personal communication best serves that role.

According to Singh (1993), two important determinants to exploiting IT are motivation and ability. *Motivation* is a function of the perceived use of IT in furthering organisational goals and objectives to an extent that the survival and growth of both the organisations and key individuals in it depend on results, which are quantifiable and measurable. The motivation for experimenting with new approaches and technologies will be strong. *Ability,* on the other hand, has structural, procedural, and behavioural dimensions. Concerned personnel should be provided with the relevant socio-technical skills, appropriate structural mechanisms must be put in place, and a climate supportive of the use of IT must be created.

Motivation of individuals involved in the implementation process is one important behavioural factor identified by McKersie and Walton (1991) that is relevant to successful implementation of information systems. Lack of positive motivation is cited as one causal factor in those cases where the potential of an information system was not fully utilised or was delayed. Moreover, the authors note that "in all the case studies in which IT implementation met with some degree of success, a person... performed the crucial function of leadership and facilitation" (p.268). Motivating and leading all who have a role in the new technology is one of the managers' key functions. The studies demonstrate that the implementation of IS in the work-place requires that the change process be managed effectively; leadership plays a key role in this process.

Several researchers have in fact stated that one essential factor in determining an organisation's successful use of CBIS is support by the top management (see e.g. Ein-Dor & Segev, 1988; Rivard & Huff, 1988). Organisational support provided by top management was found to be positively related to computer use and to user satisfaction (Bailey & Pearson, 1983; Ives *et al.* 1983; Rushinek & Rushinek, 1986; Rivard & Huff, 1988). The importance of senior executives' involvement grows with the increased sophistication of IS and the growing reliance on these systems by middle and upper management (Jarvenpaa & Ives, 1990; Rockart, 1988). Research also suggests that the greater the computer use, the greater are its realised benefits (productivity, information) for professional workers (Northrop, Dutton, & Kraemer, 1982; Danziger & Kraemer, 1985).

The senior executives[2] may be important to the implementation of CBIS because of their skills in bringing about organisational change, as can be judged from the current literature on strategic uses of IT. The outcome of being IT champions is that they have the organisational power and understanding needed to overcome resistance to such organisational changes (Kanter, 1983; Maidique, 1980; Rogers, 1983; Schon, 1963) to resolve tough disputes, to override established norms, and to ignore anguished cries of "It won't work!" from those who stand to lose with the new system as the enthusiastic, visionary senior executives push their ideas around and through the organisation. Speedy implementation can be critically important with competitive advantage at risk. The competitors deliberate over the feasibility of an idea while successful senior executive can break down bureaucratic barriers and drive change through the organisation. The tendency of the senior executive IT champion to do it alone has created new (and often profitable) islands of automation (Beath & Ives, 1988; Vitale & Ives, 1988). Determined senior executive IT champions may not be

[2] This study uses the term 'senior executives' to refer to those who are in charge or at the head of an organisation and their deputies. In Malaysian governmental organisations, senior executives are referred as Secretary-Generals (SG), Deputy Secretary-Generals (DSG), Director-Generals (DG), Deputy Director-Generals (DDG), and include also any executives in Grade One (I) and above, as shown in Table 5.1.

easy to support, but if they are moving full-steam-ahead on the implementation of systems of strategic importance to the organisation, they can be valuable partners for information systems.

Beath (1991), stresses how IS managers should support IT champions if they wish to obtain the utmost support in furthering an organisation's goals and objectives. She poses the following questions:

- How might the IT champion's organisational understanding, commitment, and energy be brought to bear on the firm's overall IT agenda?
- What assistance should be offered to a champion and what hindrances can be avoided?

However, in her study, the questions are not directly addressed to the senior executives, as she specifically addresses questions about pro-active peer support (that is how one line manager supports another line manager).

1.3 Purpose of Research

In Malaysia, there have been two recurring phenomena over the years. First, there has been the evident absence of senior executive commitment, focus, and direction in CBIS. Although senior executives in government agencies are given enough exposure to CBIS, only a handful of them show a keen interest. Often they look on decision support tools such as CBISs as infiltrating their areas of interest and fear that they may usurp some of their power and authority. The negative attitude and leadership behaviour of some senior executives have in fact caused the failure of some IS projects. However, some others' positive attitude and behaviour towards it have also been a factor for success in some IS projects. Thus, recognising the role of senior executives' influence in any IS activities in government organisations is very important.

Second, the existing CBIS in government organisations were originally designed without any strong conceptual foundation. IS practitioners in government organisations not only have little methodical guidance on how to deal with organisational change and issues related to organisational changed roles, but also lack skill in managing their relationships with their managers and sponsors. Their efforts continue to focus mainly on systemizing the most technical tasks in IS implementation process, without considering the importance of social factors such as senior executives' attitudes and support.

This experience raises the following issues:

- Do most senior executives show any interest in using the CBIS?
- Are they satisfied with the facilities provided or usability for their work?
- Is their lack of interest the result of ignorance or of the inflexibility of the system?
- How much do they know about the strengths and weaknesses of CBIS?
- What are the characteristics of CBIS that discourage the use by or involvement of the senior executives?
- Is their lack of interest the result of their negative perception of IS practitioners?
- What alternative method or methods are there besides CBIS that can serve their functional needs in an organisation?
- Is their lack of interest because of the decision-making process, communication or working procedures that exist in the government organisation?
- Is the hierarchical structure being threatened by introducing new technology?
- How does the culture affect the use of and value attached to information in Malaysian government organisations?

- How and what strategy should IS practitioners use to influence the commitment, focus, and attention of senior executives?

In an attempt to answer the above questions, the main objectives of the present research are to understand the significance of senior executives' role and its relationship to the CBIS implementation process, and to discover and understand the underlying reasons for existing practice in those processes. It is argued that the formal-rational approach to CBIS implementation is inadequate in both descriptive and prescriptive terms, but that it nevertheless has social currency and legitimacy.

1.3.1 Implementation Defined

The term "implementation" has often been used in different ways in the implementation literature. According to Myers (1994), implementation has three distinct uses, which are listed below:

1) "Implementation as coding", which refers to the realisation of design in the hardware and software of a system.

2) "Implementation as a step in the systems development life cycle", which is frequently adopted by MIS professionals and refers to all the activities that are involved in introducing IT to an organisation at a particular stage of development.

3) "Implementation as the successful use of IT by an organisation", which is defined as the entire process of systems development. As Lucas (1990) writes, "[Implementation] is a part of a process that begins with the very first idea for a system and the changes it will bring. Implementation terminates when the system has been successfully integrated with the operations of the organisation."

It will be seen that all the above three views of implementation are significantly different in scope and emphasis. In this study, the term "implementation" is used in its broadest sense to refer to the successful use of IT by an organisation. This is consistent with the use of the term in most of the IS implementation research literature.

1.4 Theoretical Frameworks

As stated by Myers (1994), the main reason for the lack of a theoretical foundation in the CBIS implementation research area is that most of the models have been borrowed from the natural sciences, and from engineering in particular. This simply reflects the dominant paradigm in IS research, which is called "essentially positivist" by Orlikowski and Baroudi (1991). They define (p. 5) positivist studies "are premised on the existence of a prior fixed relationship within phenomena which are typically investigated with structured implementation. Such studies serve primarily to test theory, in an attempt to increase predictive understanding of phenomena."

Myers (1994) argues that if the positivist research paradigm continues to be used, real progress in understanding the implementation of IS will never be made. The assumptions made by Positivist are invalid when they are applied uncritically to social reality. For example, there is constant change among the relationships between people, organisations and technology. People think and act, and they are active creators of their physical and social reality, which is what the natural science model seems to ignore (Orlikowski & Baroudi, 1991, p. 13). Also, the positivist prediction for a predictive understanding of phenomena (in a deterministic way) ignores the facts that people continue to learn and humans can change their minds.

If the implementation of information systems is primarily concerned with people, organisations and organisational change, a theoretical approach that is

appropriate to its subject matter is required. From a positivist engineering or computer science perspective, the key question is how technology works. But as Winograd and Flores (1987) point out, this perspective neither supports an adequate understanding of what a computer does in a context of human practice, nor does it support an adequate understanding of what IS mean to people. The key questions for the implementation of IT are how computers are used, and what computerised IS means to people in an organisational context.

Further, much of the previous work on CBIS implementation has concentrated mainly on its content. It has paid inadequate attention to the process of its implementation and its links with intra-organisational and broader contexts. The process of introducing such systems normally involves significant changes to the way in which people are expected to work and interact. This process of CBIS implementation takes place across several different groups or subcultures within the evolving subtleties of the current organisational context. Markus and Robey (1988) pointed out the conceptualisation of the "emergent (or processual) perspective", i.e. the structural outcome of introducing a given technology (for example, CBIS). This is because of the existence of a series of decisions and interactions among different interest groups or actors in different roles within the organisation, and of chance happenings, including external events.

Walsham (1993), has linked the implementation of CBIS with the dynamics of organisational change. His broadly based work reviews the political and cultural metaphors for organisations and includes both case descriptions of organisational change processes and more prescriptive material on practical methods of intervention for an IS implementor. As reported in his study, a major strand of CBIS implementation literature is the factor approach, which aims to identify a group of variables of relevance to implementation outcomes by sampling a series of successful and unsuccessful projects. Results from this approach include the importance of top

management support and user involvement in implementing change. Walsham (1992) notes that these factors can be related to a broader view of the context and process of implementation. For example, top management support can be seen as a contextual condition, which is desirable in principle for providing appropriate strategic vision and managerial authority. It is also relevant to a processual analysis intended to help bring about the process of cultural change with the right amount of political backing.

Levine and Rossmoore (1995) use the "action theory of human behaviour" to frame an understanding of the political forces that shape IT implementation. This theory states that the individual action stems from privately held, often unconscious, theories-in-use that people naturally maintain to help explain the world they inhabit and over which they wish to have some control. The paper argues that a key factor in diagnosing and managing the human threat to IT implementation will be missed if politics and power relationships are not brought to the surface. The authors further offer a set of steps for making a politically informed intervention in the management of IT design and implementation.

This study argues that an implementation using a richer, integrative view of IS is required. One such approach is proposed in this study: the multiple perspectives of the CBIS implementation process. The principle of multiple perspectives has been influential in other areas. For example, in strategic management, Mason and Mitroff's (1981) *Strategic Assumption Surfacing and Testing* identifies, debates, and synthesises the assumptions of different stakeholders (individuals, groups, organisations, or institutions) who can affect or be affected by the project. In the same way, Linstone's Multiple Perspective Method requires analysts to explore contexts from three perspectives: organisational (O), personal (P), and technical (T). Mitroff and Linstone (1993) link their underlying concept to Unbound Systems Thinking, which they herald as the new thinking for the twenty-first century.

Within the organisational (O) perspectives, Walsham's framework enables a wider discussion to be undertaken, addressing the social, cultural, and political aspects, among others, of change in an organisational context. Therefore, the organisational analysis in this study follows the Walsham (1993) Multilevel framework (Table 1.1):

Table 1.1: Walsham's (1993) Analytical Framework

Key Components	Associated Conceptual Elements
Content	Organisation - products/ processes/ systems CBIS - hardware/ software/ systems
Social context	Web models - social relations/ infrastructure/ history Multilevel contexts
Social Process	Culture - subculture/ multiple meanings politics - control and autonomy/ morality
Context/ Process Linkage	Structuration theory: - action and structure duality IS and modalities: - embody interpretative schemes - provide co-ordination and control facilities - encapsulate norms

1) The *contents* of CBIS implementation involve products, processes, and systems. Changes to CBIS also involve computer hardware, software, operating systems, and related technologies.

2) The *social context* was firstly drawn from the concepts of web models as a way of identifying and tracing the social context of a CBIS. Elements of this approach include the social relations between participants concerned with the IS (for example, senior executives and IS practitioners), the social infrastructure available or necessary for its support, and the history of previous commitments made about CBIS. Besides web

models, the importance of broader social contexts includes the environment - for example, relationships with other agencies.

3) The *social process* involves taking both cultural and political perspectives of the CBIS implementation. The cultural perspective highlights how the CBIS is related to maintaining and changing subcultures, the interaction at the boundaries between subcultures, and the multiple meanings ascribed by different groups (senior executives and IS practitioners) to the same events and actions. The political perspective highlights the CBIS as involving control and domination. It is implicated in moral issues such as the quality of the working experience, and has a part to play in the dynamics of managing the balance between autonomy and control in organisations.

4) The final component in the analytical framework concerns the *linkage between social context and social process,* using structuration theory as a conceptual approach. CBIS are deeply involved in the modalities that link social context and social process in present-day organisations. CBIS embody interpretative schemes, provide co-ordination and control facilities, and encapsulate norms. They are drawn upon the social processes that take place in organisations and, in so doing, social structures are reinforced or changed. Empirical investigations based on the theory are concerned with tracing these structuring processes over time.

The Competing Values Framework (Hart & Quinn, 1993) is used to help interpret and understand the Personal (P) perspective of senior executives' leadership together with Hirschheim and Klein's (1989) and Wood-Harper's (1985) framework of archetypal IS Practitioners roles. Technical (T) perspective, together with O and P perspectives, are then analysed using Multiview Methodology (Wood-Harper, 1989;

Avison & Wood-Harper, 1990; and Bell & Wood-Harper, 1990[3], 1992), which incorporates all three elements of the TOP model.

1.5 Research Questions

The strategies used to understand and encourage senior executives' support in a CBIS implementation are to take a global perspective and to address concurrently the major human, social, and organisational problems outlined in the previous section. The focus of this research is on groups of individuals such as senior executives and IS practitioners.

Accordingly, the present research attempts to answer the following research questions:

1) How and to what extent do the senior executives influence the implementation process of CBIS?

2) What is a suitable strategy for senior executives' support in CBIS implementation process?

The aim of this research is to develop and implement a coherent senior executive support strategy that addresses within its framework:

(i) Understanding the senior executives' influence and its relationship to the IS implementation process;

[3] This study attempts to extend the earlier model of Web and Multiview developed by Bell and Wood-Harper (1990), by incorporating the element of Walsham (1993) Context-Process linkage. The Context-Process linkages were operationalised through structuration theory.

(ii) Understanding the Malaysian government's CBIS policies and their implementation impact;

(iii) Discovering the worldviews of senior executives and IS practitioners for their existing practices in the IS implementation process in Malaysian government organisations; and

(iv) Formulating a senior executives' support strategy within the CBIS implementation process.

1.5.1 Importance of the Research

The study is important from the perspective of designing effective information systems for government organisations, because:

(1) There is a need for more qualitative studies that contribute to our search for increased understanding of IS phenomena. Studying the interdependence of technical and social change (senior executives' influence) using a qualitative method of inquiry will enhance the subjective understanding of these phenomena.

(2) Senior executives in government organisations are important stakeholders. They can affect as well as be affected by an individual's, group's, or institution's policy or policies (Mitroff & Linstone, 1993). Therefore, the environmental and behavioural factors need to be considered in designing CBIS (i.e. the behaviour of senior executives is not well understood by Systems Analysts).

(3) IS practitioners (or systems analysts) in government organisations have little methodical guidance on how to deal with organisational changes and issues related to

organisational roles. Their efforts continue to focus mainly into systemizing the most technical tasks of CBIS implementation.

(4) To what extent has the research been done on developing IS in government organisations, especially in a Malaysian context?[4] and, what are the level of efficiencies in developing CBIS in such organisations? (Mohamed, 1990; Han, 1991).

1.6 Research Perspective

Many writers have recommended that to conduct meaningful research in information systems, the researcher has to consider the purpose of research, and the nature of the phenomena under investigation (Jenkins, 1985; Galliers & Land, 1987). Various frameworks have been developed for aiding researchers to explain their assumptions and beliefs underlying these considerations (Franz & Robey,1987; Markus & Robey, 1988; Craig Smith, 1988; Orlikowski & Baroudi, 1991). These assumptions and beliefs relate to the nature of IS (ontological beliefs), the purpose of conducting research, and how to advance knowledge in the field (epistemological beliefs). These ideas are aimed at encouraging researchers to consider alternative philosophical bases and to adopt approaches that are more subjective, less functional, and less deterministic. Culnan (1987), Ang and Pavri (1994), and Galliers (1994) have also called for a pluralist perspective to incorporate the multiple paradigm discipline in the IS implementation process because each contribution would help shed light on and bring more understanding to the way that information is generated, processed, and disseminated.

[4] In the present researcher's knowledge, so far only the study by Han (1991) relates the IT policy formulation and implementation and its effects departmental computing in Malaysian government organisations.

This work examines the role of senior executives in the implementation of CBIS in government organisations and aims at advancing knowledge contributing to improved information systems development (ISD) methods to be practised by IS professionals/ practitioners.

The importance of analysing the social context surrounding an IS has been noted earlier in this chapter. In the context of CBIS, the literature describs how social and political pressures are exerted on the implementation of CBIS. These pressures were seen to originate from senior executives at the higher levels within the hierarchy. In addition, the pressures are also exerted by socio-political factors in the divisional and operational levels. In such an environment, the implementation of CBIS may cause changes in the environment, which may alter the roles of individuals, departments, and organisations. It is therefore assumed that the social context will play a decisive role in the implementation of CBIS in the organisation.

Based on Lee's integrated approaches, the conduct of this research is tabulated in Table 1.2 (Lee, 1991). The research work is carried out in two phases. Phase 1 is a survey and acts as an exploratory study for phase 2, which is based on case studies. In phase 2, following the ontological belief explained above, the study of CBIS implementation in government organisations presents a rich source of behavioural issues, which are not at all well understood. As noted in the literature review, empirical studies of CBIS implementation have revealed a lack of understanding of the stakeholder's role and perceptions at various levels and about how the social context interacts with the CBIS implementation process. This suggests that knowledge in the field can only be advanced by understanding and interpreting the ongoing relationship between the process of IS implementation and the social context within which the system is embedded.

Table 1.2: An Integrated Research Framework
(Adapted from Lee, 1991)[5]

	Positivist Understanding Phase 1	Interpretative Understanding Phase 2
Purpose of research	• to examine the role of senior executives in the implementation of CBIS in government organisations	
Nature of phenomena under investigation (assumptions and beliefs):	• the implementation of CBIS may cause changes in the environment which may alter the role of individuals, departments, and organisations	
Ontology	• to obtain snapshots of practices and situations at any time to confirm or disconfirm the theoretical propositions through empirical testing	• to understand how and why individuals, through their socialisation into, interaction with, and participation in, a social world, give it a certain status and meaning
Epistemology	• to focus on the purely physical or behaviourist component of the predicted actions	• to understand and interpret the ongoing relationship between the process of IS implementation and the social context

Through improved understanding, the aim of the current research is to increase an awareness of the critical process in CBIS and improve its practical implementation in government organisations. The findings are, therefore, intended to initiate change in social relationships and work practices in the government administration. The current research is therefore guided by the epistemological belief that the primary endeavour is to interpret and analyse the social world from the stakeholder's perspective. It is assumed that the criteria by which knowledge in the field can be identified may be constructed by describing how practices and meanings are formed, and by analysing the language and tacit norms shared by actors in the situation being investigated.

[5] Lee (1991) has suggested three levels of understanding: the subjective understanding, the interpretative understanding, and the positivist understanding (Table 3.1). However, his framework is adapted here not in sequence but according to the priority of events that are relevant to this study.

1.6.1 The Malaysian Civil Service

The Malaysian Civil Service operates within the Malaysian cultural context, which is characterised by the notion of hierarchical structure. There is a tendency towards formal structures, figure-heads, and inhibition in implementing proactive strategies that support organisational development. The aspirations of the Sixth Malaysian Plan (1990) included the reform of Civil Service structures and operations, which would stimulate the parallel development of Malaysia as an information-rich society by emphasising on the development of standards and practices, database development in support of DDP development, data security, a government data network, personnel development, and a programme in support of IT awareness and promotion. However, the unintended outcome of government policy on these reforms such as the behaviour and influence of senior executives, users and IS practitioners provided the basis for this research work.

1.6.2 The Researcher's Background

From an early age in Malaysia, the researcher has maintained a focus on the possibilities offered by technological developments and because of this he chose to orientate his studies and career towards the computer sciences. However, after 15 years as an IT practitioner, he came to understand that the impact of technology on organisational structures and behaviours was often more descriptive than beneficial. He was introduced to new ideas in systems thinking during 1992, and he was able to readily accept that there was a gap in his knowledge. At the same time, he felt that such concepts explained his experiences.

However, the lack of available study material and investigative opportunities prompted him to undertake research into the areas of information management that

were the causes of his concern. He undertook this research work with the objective of challenging traditional IT thinking, work practices, and management strategies.

1.7 Limitations of the Research

The approach presented in this research has evolved through a series of questionnaire surveys, cumulative observations, and surveys grounded in active experience, as well as through exposure to the empirical findings obtained by other practitioners (i.e. senior executives and systems analysts) in the field through case studies. The application context is the Malaysian government organisations' environment.

Several limitations, which could have some impact on the quality of the results generated by this research, were encountered and recognised during each of the two phases of this study. The use of mailed questionnaires in the exploratory study as the main means of obtaining data on the existing executives' participation, involvement, commitment, and leadership roles, as well as the relevant organisational variables had several limitations. There was the possibility that the respondents might not understand the questions. One could be very careful in identifying the variables, and yet there was no assurance that the respondents were answering the same questions that the research intended to ask. Another possibility is that the questions asked did not address the specific issue as intended. A third possibility is that deliberately incorrect answers might have been furnished, which is difficult to control.

The selection of respondents for the interviews was restricted by the number of officers who were willing to be interviewed. Some respondents were not available for interview owing to the exigencies of service, despite previously agreed appointments. In such cases the researcher had to be satisfied with the alternative officers provided.

The findings are based on what was reported by the respondents during the interviews, and could not be fully cross-validated since, for instance, only limited participant observation activities were conducted. Therefore, there could be some degree of unknown bias and misunderstanding in what has been reported by the respondents and hence included in this study.

One of the frequent objections to the case study method, as noted by Lee (1989), is that generalisations cannot be made when only a minimal contribution is made to the body of knowledge. He further argues that the case study method has led to anecdotalism and a lack of objectivity in research. However, in reply to these criticisms, Craigh Smith (1988) argues that while the case study approach cannot offer generalisation in the statistical sense, it is capable of developing generalisable concepts by means of logical inference. Several writers have also appealed for professionalism in case study research to make qualitative research appear acceptable and rigorous (Benbasat, 1987; Craigh Smith, 1988). Brittain White (1985) stresses the point that researchers are subjective people who will undertake their research from a particular standpoint or with a particular bias. In order to carry out reasonably valid research, it is necessary for the researcher to make this standpoint overt by open self-perception. She claims that "the better one understand one's own perception, the better one is able to accurately study the behaviour of others."

Another point to mention is that the author's focus on the managerial as opposed to the technical aspects of IS is not intended to deny the importance of the technology, but rather to redress the excessive emphasis often given to it in the literature. In many situations, technical problems and issues are the determining factors, although this was not the case in the immediate circumstances of the two case studies presented here.

Finally, a fairly obvious limitation of the research relates to the use of an interpretative approach. Concomitant with the emphasis on multiple perspectives comes a difficulty in getting through to the core of a situation. In the theoretical and empirical research, this problem was addressed by means of multiple data sources, cross-checking, and triangulation where appropriate, yet the collection of data ceased at a point determined in part by "saturation" of the theory (Glasser & Strauss, 1967) and in part by constraints on time so that the results, in the end, are dependent on the researcher's own interpretation of events. It is hoped that, having declared a set of beliefs and assumptions regarding the conduct of research in this chapter, it will be possible for readers to bear these in mind when making one's own interpretation of the findings.

1.8 Structure of the Thesis

The structure of the thesis is shown in Figure 1.1 as a dynamic interaction of meaningful research elements within an evolving research process.

The first chapter provides an introductory description of the research problem and argues for the importance of the research. The research approach is introduced, and assumptions and limitations are discussed relative to the objectives of the project.

Having set the scene in Chapter 1, Chapter 2, reviews the literature about prior/ previous similar research. This chapter reviews IS research in general and here a case is developed to support the approach adopted for this work. Then, a review is made of similar IS research projects. The multiple perspective approach as an appropriate mode of inquiry is presented and attempts are made to justify it. The methodology employed is derived systematically from assumptions held by the researcher concerning the nature of the research topic and the form of this type of research. The purpose in

defining these assumptions at the beginning is to provide justification for the research methodology adopted and to formulate the conduct of the research in a field that is characterised by complex social interactions.

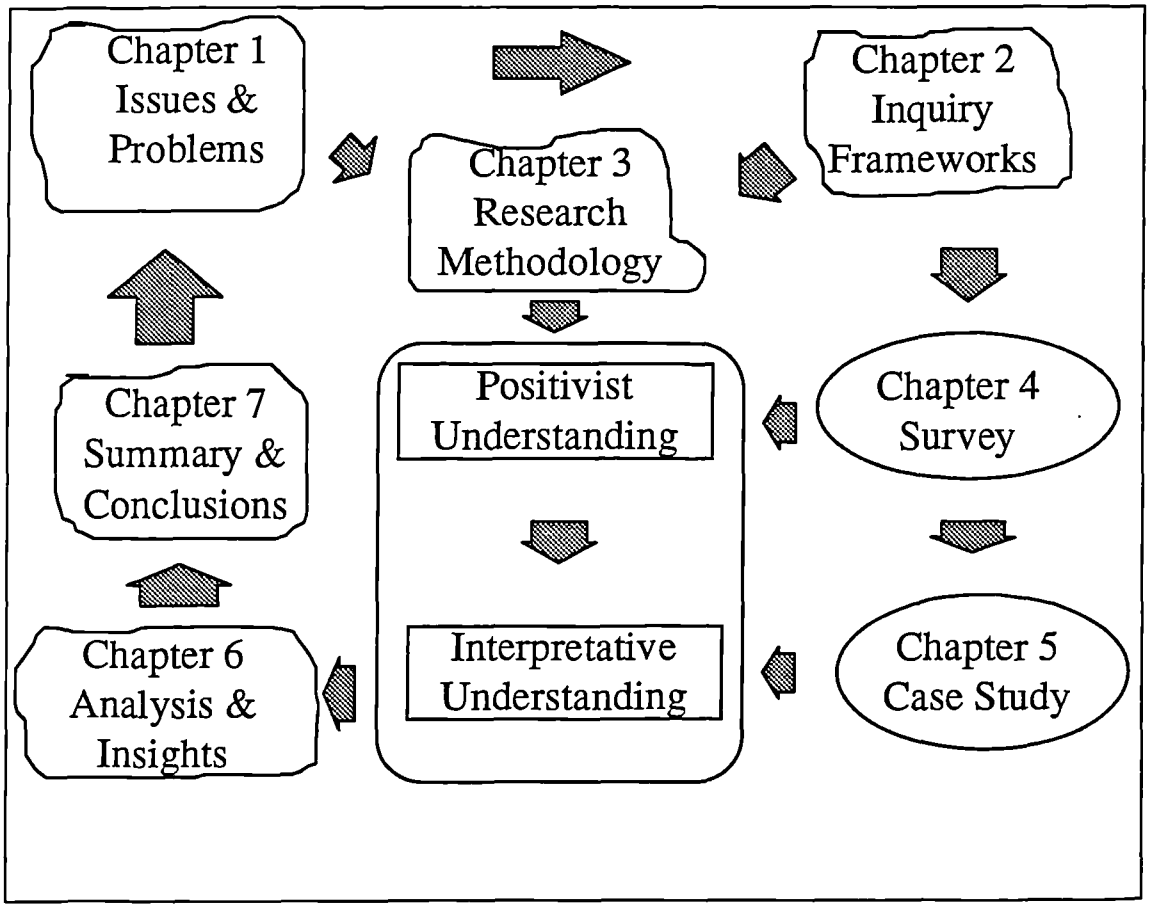

Figure 1.1: A Design Walk-through of the Structural Elements of the Thesis

Chapter 3 returns to a more detailed discussion of the research methodology. Research in general is discussed in presenting evidence in support of the research approach adopted for this project. In this study, the collection of qualitative data (case studies) is considered to be the major method besides quantitative analysis (questionnaire survey). The research approach is a combined methodology utilising quantitative and qualitative methods. Therefore, the research design has two inter-related phases comprising an exploratory study (questionnaire survey) and case studies. Surveys are a useful means of obtaining snapshots of practices and situations at any point in time, but usually they provide little insight into the causes of the

phenomena observed in such a study. Nor do they provide information concerning the processes behind the observed phenomena. The case study method, however, has the advantage of capturing reality in greater detail and provides information on a greater number of variables and their underlying processes.

The exploratory study is presented in Chapter 4. The significance of the behavioural and organisational factors in implementing CBIS projects in Malaysian government organisations is explored in the survey. The questionnaire survey helped to fulfil the first objective of the study, which was to understand the senior executives' influence on and their relationship to the IS implementation process. The factors derived from the survey provide useful information for the case study projects in the following chapter.

Chapter 5 fulfils the second objective of this research which was to understand the underlying reasons for the existing practice of the IS implementation process by IS practitioners and senior executives in government organisations by taking into account their respective worldviews. Survey findings are further explored through case studies, which further refine the conceptual model. Most importantly, it is shown how the case study findings are supported by the findings from the survey, and what interpretations can be placed on this highly significant convergence of the separate lines of investigation adopted in the research study. Besides analysing the role of central agencies, two of the government's operating agencies are also studied. These are the Ministry of Land and Co-operative Development, and the Immigration Department. The discussion covers the initiating and implementing of the operating agencies' information systems concerned with development and management processes over a period of some ten years and relates these systems to their broader contexts.

An in-depth analysis of the case studies is presented in Chapter 6. In this chapter, the case studies are analysed using a Multiple Perspective Framework with the

objective of gaining an understanding of the IS implementation process in government organisations and drawing more general insights concerning senior executives' and IS practitioners' roles and perspectives, and the implications of these for practice. The insights from the multiple perspective approach, which includes multilevel process analyses and the Multiview methodology, is then pulled together to produce practical guidance in the form of an IS implementation framework.

Chapter 7 concludes the thesis with a review and a summary of the research. Here, all the findings of the thesis are tied together and implications for theory, method, and practice are explained. A general synthesis of the major findings of the research is also presented and then some theoretical, methodological, and practical insights derived from the research are discussed. The chapter concludes with an assessment of the contribution this work makes in the larger context of IS research and suggestions are also included for future research.

2 IS Research and the Choice of an Implementation Framework

Chapter 1 has presented the research issues and problems. This chapter presents a description of research related to IS implementation. The discussion is divided into three major sections, presenting respectively a general overview of IS research frameworks, related research projects, and proposed CBIS implementation frameworks.

Firstly, a general discussion of IS research frameworks is presented. These frameworks suggest various approaches to conducting information systems research. This section includes a discussion of how each of the research frameworks presented suggests a variety of research approaches.

Secondly, similar IS research projects, are reviewed. These related projects are selected with reference to either the research approach or the major research subject.

Thirdly, we review, a number of implementation frameworks embodying an approach similar to the one adopted for the present research project. The reviewed frameworks thus offer support for this work and contain ideas about how to conduct the research. The frameworks described here are discussed with emphasis placed upon those approaches which support the objectives of the present study. Also, it is unfortunate that similar research projects in the past have been inclined to attempt to address the topic of this current research work.

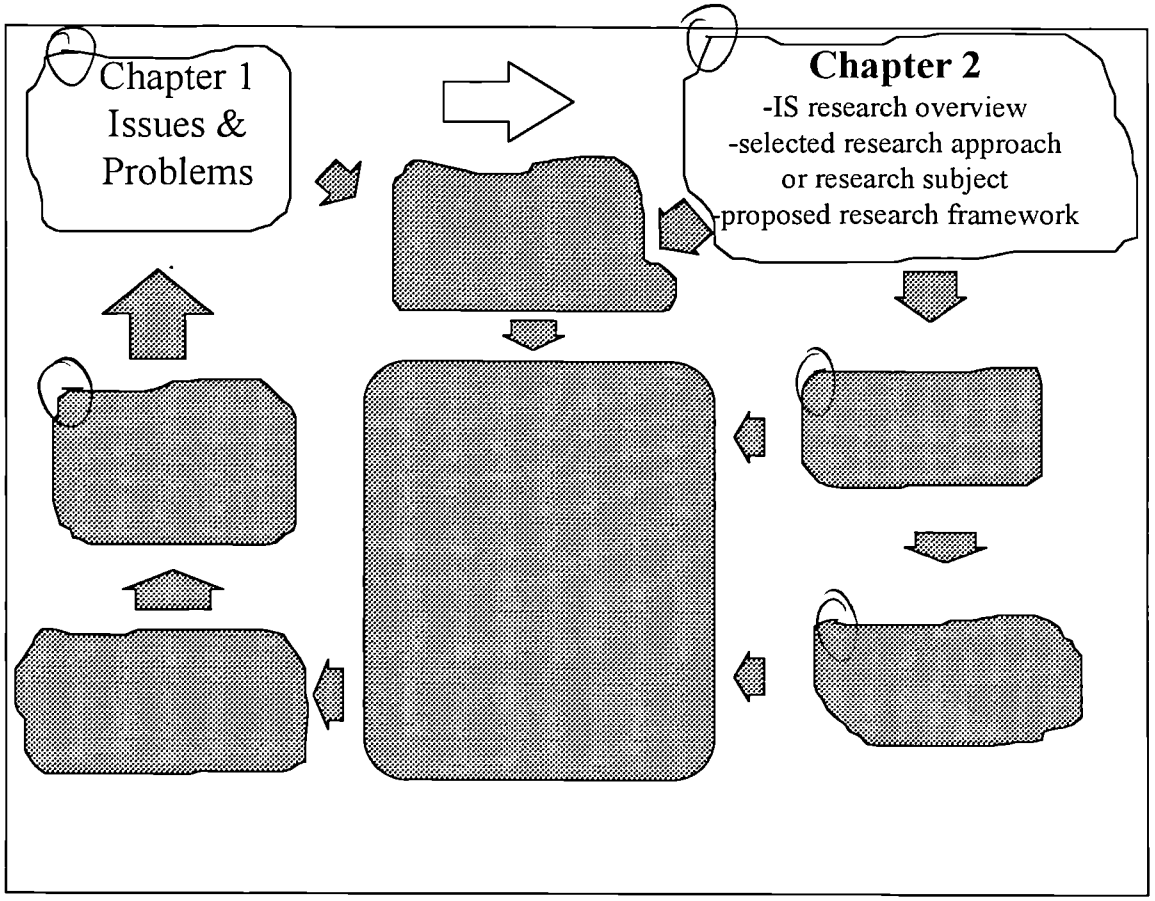

Figure 2.1: Chapter 2 Research Processes

2.1 A General Overview of IS Research Frameworks

This section reviews readily available literature dealing with the various frameworks which attempt to provide a context in which to conduct IS research.

The broad theme of the IFIP WG 8.2 Colloquium: "Information Systems Research - A Doubtful Science?" held in Manchester, 1984 (Mumford, Hirschheim, Fitzgerald & Wood-Harper, 1985) is that the design and development of IS are process driven and affected by social and political factors. It is contended that the methodologies of social research are the most appropriate way of understanding the nature and impact of IS and that research into IS has been badly hampered by the lack of consideration given to this view. Indeed, the impact of the social and political dimensions makes some form of social research the only viable approach that can be adopted.

To most members of the academic community, researchers and scientists, these are unfamiliar and untested notions and hence the major problem with IS as a research discipline. The design and introduction of IS in social situation such as complex organisations can be considered as a sociological problem, which cannot be understood without reference to current developments in sociological thought and cannot sensibly be studied without a knowledge of the methods of social research. IS has been lamentably slow to grasp this point (White, 1987).

Several problems have emerged as a result of a number of attempts to classify IS as a discipline in its own right. In particular, people have been asking whether IS is a science. Both the emphasis on technological solutions, so often evidenced in the American literature, and the pervasive nature of the scientific tradition in Western research have stimulated much debate. Mumford *et al.* (1985) and Kutti (1991) have both demonstrated the difficulties that attend the forming of a consensus in the area of micro social systems research.

Two opposing approaches to technology and social change have been long identifiable in the literature (Orlikowski, 1992). They are causal or deterministic models based on the idea of one thing "impacting" on another to cause change. Firstly,

there is the technology impact model whereby morally neutral technological progress is said to impact on the functioning of a social system. Secondly, there is the social impact model whereby social values, expressed through the controlled and intentional application of a technology, are said to impact on the use and design of the technology. In theory, each model can predict a wide range of possible outcomes. The first however is most often associated with notions of control, predictions of job losses, and deskilling, while the second is often associated with predictions of changes that reflect the dominant social values of a group, an organisation or a society (Zuboff, 1988; Fletcher, 1995).

Literature in the area of technology impacts is correspondingly large and heterogeneous, although there exists a multitude of analytical approaches to the question of technological impacts. The above classifications were used as a basis to classify the information systems research. It is classified here with reference to the single and multiple perspectives frameworks.

2.1.1 Information Systems Research

a) The Single Perspective Approach

- **Technology Impact Model**

Underlying this model is the notion of an impartial and objective technology impacting upon its social milieu. In the technology impact model, IS are seen as a substitute for labour, in much the same way as "automation" is used on the shop floor. The central argument is that technology can perform the work of managers more efficiently than a human beings. Technology is usually conceived of as a machine or some technical process and is presented as the outcome of scientific progress. Technology is used to improve some mechanistic notion of "efficiency", for example, the speed or the volume of transactions processed.

Symons (1990) took a deterministic and mechanistic approach to describe this model. The technological determinist view takes two main forms: optimism and pessimism. The optimist subscribes to the view of IT promulgated by the computer press, believing that IT may be installed in an organisation with immediate and spectacularly beneficial effects, including increased productivity, efficiency and effectiveness; new employment opportunities; enhanced communication; and improved quality of life for all. New technology is depicted as the key to progress. The pessimist is at the pole opposite to technological determinist thought. According to this view the introduction of new technology is inevitably accompanied by widespread job losses, a deskilling of remaining work, increased centralisation of power, and a lessening of personal privacy and freedom (Hirschheim, 1985b). Office automation together with factory automation are said to have deleterious consequences for job satisfaction and the general quality of working life. According to the pessimists, a more integrated IS have developed, the role of human managers has inevitably becomes degraded. Their role contracts progressively until eventually it disappears altogether. Highly skilled "knowledge" workers will be well placed to win the small number of new jobs created following the recession of the late 1980s to early 1990s (Rajan, 1992).

The mechanistic approach stands in between optimism and pessimism and concerns itself with the criteria for application of "successful" and "acceptable" technologies in appropriate circumstances. A pattern of precisely defined jobs, ordered in a hierarchical manner through precisely defined lines of command or communication, has direct and important implications for the development of IS.

Following the dictum of classical management theorists that the goal of successful management is the achievement of balance or harmony between the human (subjective) and technical (objective) aspects of organisation, the tendency has too frequently been an effort to force humans into the mould of mechanical organisations

rather than the opposite, humanistic tendency (Morgan, 1986). This mechanistic bias has been reflected in behaviourist psychology, which treats human beings as sophisticated machines responding to multiple stimuli. The philosophical standpoint thus adopted has been used by ergonomists as the rationale for analytical studies of human behaviour. Taylor, for example, based his principles of scientific management on the breaking down of tasks into their component elements and monitoring workers' performance in their execution. The designing of classic management information systems (MIS) has followed slavishly this model of administrative order. According to this system, the various administrative functions are distinguished into precise, accurate, and reliable components, so that their execution can be achieved in a single, integrated system emphasising data processing and routine transactions under a top-down, centralised control. In Weber's analysis of bureaucracy, command and rules are intimately linked, just as in MIS.

The inability to model changing circumstances is the major weakness of the mechanistic approach. Even though sub-units have their own objectives and motivations, it assumes consensus among employees and a unitary set of goals. However, the assumed subordination of individual interest to the general interest may not be valid. The model's emphasis on precision and reliability can have self-defeating consequences; rules, designed as means to ends, may well become ends in themselves. In addition, these views on work can have dehumanising effects, as has been adequately demonstrated. The importance of informal group processes for morale and productivity in industry has been demonstrated through investigation of the relation between conditions of work and the incidence of fatigue and boredom among employees. Organisational development is such a complex, uncertain, and difficult business that it is often impossible to view it purely as a rational, technical process. Mechanical imagery tends to underplay the human aspects of organisation and to overlook the fact that not all the tasks facing organisations can be performed by machines (Morgan, 1986).

The mechanistic approach has its philosophical roots in closed systems theory. Systems theory developed in response to the need for techniques to deal with complexity; problems involving many interlinked variables are not necessarily reducible to connections between individual components, but require a consideration of the functioning of the whole system. Closed systems theory sets the boundary of study at the limits of the organisation. Thereby the external environment is excluded from analysis. Within the system, the emphasis is on the efficiency of input-output transformations.

This model's deterministic emphasis and its view of change as involving a linear progression have been severely criticised by Fleck *et al.* (1990). Moreover, its tendency is to ignore the influence of human action on the development and use of technology (Child, 1972; Kling and Iacono, 1984; Wilkinson, 1983; Zuboff, 1988).

- **The Social Impact Model**

The social impact model sets technology squarely in the human context, not as the cause but as the agent of intended change. The emphasis is not on the technology itself, but on how it is designed and utilised, recognising that subjective social values influence both the design and use of technology. Central to the philosophy of the social impact model is the belief that there is no such thing as objective scientific progress, but rather that social values both create and guide technology for the purpose of achieving a previewed outcome. It is observed that the technology impact model itself assumes that certain rules and procedures (the social values) are often envisaged in the term "technology", thus assuming a broader interpretation than the title "technology impact model" would appear to allow for (MacDonald, 1985). Following instead the social impact model, it is believed that by allowing people, time, information, and relevant organisational structures, so that they may approach their work more

creatively, technology may be used as a pathway to reaching a more subjective, and therefore more satisfying, goal of "effectiveness".

The social impact model has, however, come in for criticism for a number of different reasons. It has been accused of pushing technology into the margins (McLoughlin & Clark, 1988). Alternatively, it has been accused of replacing one form of determinism (scientific progress) with another (human improvement). Again, while it has brought into the picture the impact made by human agencies, it has been criticised for ignoring social and economic forces which may lay beyond the control of the persons involved (Wilkinson, 1985). It has also been accused of actually understating the influence of human actions (Orlikowski, 1992).

b) The Multiple Perspective Approach

The examination of the research arguments based on a single perspective approach takes account of technology impact and social impact models, but may be limited in scope. This section develops the various aspects of the technology impact model from the multiple perspective approach.

- **Integrationist Model**

Some researchers disagree with the notion that a clear distinction can be made between technical and behavioural aspects (Hirschheim, Klein and Newman, 1987; Smithson and Land, 1986). According to them, the impact of IT on social and organisational relationships is so profound and wide-ranging that the behavioural effects are separable only analytically from the technical, so that IS are better conceptualised as social systems in which technology is only one, although an important one, of the components. Where the mechanistic approach takes ISD to be a technical process and the systems approach sees it as a technical process with

behavioural consequences, this group of interactionists regards ISD as a social process based on technology. However, there has recently been growing interest in a reconceptualisation of technology that integrates features of both the technology and social impact models.

A more practical approach has been adopted by regarding IS as a social process, the results of which can be justified by logical argument (Lyytinen & Hirschheim, 1988). Giddens (1984) formulated his "structuration theory" and has received support from other researchers because of the clear classifications and the mechanism for linking context and process. Orlikowski, drawing on Giddens's theory of structuration (Giddens, 1984), has developed an integrationist approach which she labels "the structurational model of technology" (Orlikowski, 1992). Orlikowski & Robey (1991) recognise IS not only as an interactive social system, but also as a product, and have developed a structuration model which combines both perspectives. This approach is viewed as providing a means of conducting new empirical research on both the ISD process and the implications of IS use (Jones and Nandhakumar, 1993; Orlikowski, 1992; Walsham & Han 1990, 1991).

Wherever direct measurements can be made, some emphasis has been placed on them. In particular, the transaction cost perspective provides for analysis of interactions during contract negotiation and contract monitoring, giving a qualitative and quantitative analysis in this area of interaction (Cibbora, 1987). A broader and more qualitative interaction perspective examines the organisational context in which people operate and interact, and relates IS on the basis of further contextual analysis (Markus, 1984; Markus & Robey, 1988). According to Lyytinen (1986) and Ulrich (1988), collective acts are carried out as a result of collective decisions as well as individual acts, and they discuss how these acts can be understood by the process of teleological analysis. Boland and Day (1982) stressed the importance of symbolic forms and used them to describe the interaction of individuals with IS. IS seem to have

an impact on the individuals with text interpretation and making sense in the hermeneutic perspective (Klein & Hirschheim, 1983; Boland, 1985; Boland & Wesley, 1989, Myers, 1994). According to Walsham (1993), IS are best studied in an organisational context and appropriate theories are to be applied which recognise that IS are primarily people's systems rather than technical ones. This issue has also been addressed by other authors (Hirschheim and Smithson, 1987; Tricker, 1992).

According to Kimble and McLoughlin (1995), the integrationist model refuses to view an "impact" as the product of a sequence of interacting forces. Rejecting altogether the notion of "result", the emphasis is placed instead on the complexity of actors, interaction, and the ongoing process. The principal mechanism seen to be at work is the individual and groups of individuals, acting freely yet within the constraints of the existing situation. "Impact" thus becomes in Kimble and McLoughlin's theory the "outcome at any particular time", which of course is never final but shaped by continuing dynamic forces both prior and present. Thus, this integrationist view does not envisage either technology "impacting" on the social environment, or vice versa, but each moulding the other over the course of time. The model therefore rejects the possibility of a deterministic view of outcomes, but nevertheless allows that clearer understanding of past interactions may help in developing a more precise view of the future.

Mumford *et al.* (1985) set out some implications for research methods in IS while assessing the value of this approach for IS research. Walsham and Han (1991) also noted its value as a means of locating and re-interpreting earlier approaches such as web models and institutional analysis (Kling and Scacchi, 1980; 1982). More recently, Walsham has provided a synthesis of these different approaches into a broad analytical framework designed to advance our understanding of organisational change linked to computer-based systems (Walsham, 1993). Lyytinen *et al.* for example, consider how ISD affects the office partly as a human activity system and partly as a

social community (Lyytinen, Klein and Hirschheim, 1986). The former consideration stresses the conscious design of a set of interlinked, purposeful, human activities whereas the latter reflects the more informal and irregular side of office life - conversations, spontaneous interaction, friendly and adversarial social relationships, culture, tradition, and politics.

From the above analysis, the survey of the recent research in IS therefore demonstrates the divergent views held by different authorities. The only common trend is the continual movement away from procedural perspectives on organisational analysis and towards an emphasis on social interactions within IS environments. All of these contributions can be supported within the definitions, context, and relevant application areas, and provide elements of the overall social action perspective.

The sections that follow examine various aspects of the CBIS implementation process. Initially a CBIS implementation process is examined in isolation. Following this, the interaction between the role of senior executives and the CBIS implementation process is explored.

2.2 Related Research Projects

2.2.1 CBIS Implementation Research

There has been a large number of research reports which have accumulated over the past two decades in implementation research (Lucas, 1981; Ives & Olson, 1984; Kwon & Zmud, 1987; Lucas *et al.* 1990; Keil, 1991; Alavi & Joachimsthaler, 1992; Delone & McLean, 1992; Newman & Robey, 1992; Walsham 1993). This reveals that, on the whole, this area has yielding conflicting and somewhat confused findings (Myers, 1994). While some progress has been made, researchers continue to lament the lack of an agreed theoretical framework within which IS implementation research can proceed.

An alternative way of categorising implementation research, based on Markus & Robey's (1988) analysis, which categorises research on the basis of causal agency (i.e. belief about the nature of causality), is suggested by Keil (1991). Keil's three models are as follows:

- Implementation as technology acceptance;
- Implementation as organisational change; and
- Implementation as organisational problem-solving involving mutual adaptation.

A technology-biased view of implementation is represented in the first model. Here, the emphasis is on "the impact of information technology". Technology is seen as an exogenous force, which determines or strongly constrains the behaviour of individuals and organisations. Some of the limitations of this model are that it takes a very static view of implementation and virtually ignores organisational issues.

A process-oriented organisational change model, that was originally suggested by Lewin (1952) and expanded by Schein (1961), constitutes the second model. The Lewin-Schein model of unfreezing-changing-refreezing represents an organisation-based view of implementation. Limitations of this model are that it virtually ignores technological issues and oversimplifies organisational change by assuming that the normal state of an organisation is for it to be "frozen". This model overlooks the mutual adaptation and continual gradual changes which may occur in IS and organisations.

The third model is a process-oriented model of implementation, based on a synthesis of concepts from the management of innovation literature and organisational problem-solving literature. This model represents a technology-organisation interaction view of implementation, in which mutual adaptation is seen as an iterative process. Keil argues that this model is more realistic than the other models because it explicitly considers both technology and the organisation and provides a more complete understanding of the problem than either of the other two above models (Keil, 1991, p. 303). However, a limitation of this model is that it is too general and it does not provide a framework for striking an appropriate balance between technological and organisational adaptation (Keil, 1991, p. 302).

However, the distinction between factor and process research streams has been the most common way of categorising the implementation literature. We examine these next.

a) Factor Model

The factor model is one of several attempts to define paradigms in IS implementation research (Wastell, 1993). It is well known in many areas of cognitive and occupational psychology, as well as in some other sub-disciplines. Its principal aim

is to distinguish the independent variables (e.g. users' education, participation, and satisfaction) that have a causal relationship to the outcome of a process. No attempt is made to rationalise outcomes, but merely to associate certain levels of predictor factors with other levels of outcome factors, inferring causation between the former and latter. The factor model assumes the success of objective methods in the natural sciences as a means of arriving at valid knowledge and consequently places heavy emphasis on such methods as the careful operationalisation of constructs, exact measuring by impartial observers, and the logic of hypothesis and deduction.

Lyytinen and Hirschheim (1987) have given a fairly comprehensive list and classification of factors of relevance to IS implementation for "reasons for IS failure". These include technical features and features of the IS context, including:

- individual, organisational, and environmental aspects;
- aspects of the systems development process such as the method used or the amount of attention given to decision-making processes; and
- aspects of the system development environment such as the organisational knowledge possessed by system developers or amounts of user education.

Interactions between the factors are crucial and this list of factors provides a useful classification of much of the IS implementation literature. However, it should be noted that whilst it takes some account of the human and social aspects of IS implementation, the factors approach has a rather static feel to it, with no consideration of the dynamics of the process of organisational implementation.

Factor studies of implementation have tried to identify variables associated with some measure of implementation success. However, only a few factors have been shown to be important, in many studies, e.g. top management support has been identified with implementation success in many systems. Overall, the lack of

consistency in the research has been disappointing, and some researchers like Kwon & Zmud, (1987) have come to the conclusion that the factor research is too narrow. Boland (1989) has also observed that "our attempt to apply modern scientific method to the study of information systems in organisations does not produce the steady flow of results we had expected."

The correlations obtained in factor studies explain trivially small variants. In terms of real explanation (i.e. why certain outcomes occurred, not just what happened), they are even more otiose. No advice for serious practitioners can derive from studies seeking general laws at this level of abstraction. Moreover, the theories under test are often naive to the point of vacuity. Wastell (1993) observed that "rigour is more than a question of method! Design is a social process, yes, but surely the social dynamics of design are too complex and protean to be reduced to simple cause - effect laws?"

Similar to the factor model is the mechanistic approach to organisations and IS, discussed by Symons (1990). This is in fact an approach which underlies most work on IS and is based on what Kling (1987) described, critically, as discrete entity models, allowing however that such structured methodologies are nevertheless very useful in the design and specification of IS. Walsham (1990) draws attention to the relative simplicity, solidity, and reassuring character of the discrete entity approach to IS, which explains why so many computer professionals remain satisfied with this mechanistic, and consequently bureaucratic arrangement. As a result, bureaucracy has become the salient characteristic of modern organisations. This "technical rationality", or scientific approach to administration, has been under girded by the growth of the decision sciences, by operational research, and by management science generally (Beetham, 1987).

Two problems of the mechanistic approach in the area of IS were identified by Walsham (1989). Firstly, lack of motivation, low productivity, resistance to change, and IS "failure" as a consequence of a neglect of the organisational context of IS have negative consequences for human needs and aspirations. Secondly, a mechanistic and bureaucratic approach to IS development tends to create rigid and inflexible systems, which are ill suited to the need for adaptation to organisational change.

To summarise, various IS researchers (Hirschheim *et al.* 1987; Tait and Vessey, 1988), are dissatisfied with the factor model. They have called for more process research, for example, longitudinal qualitative case studies. Process research differs from the factor paradigm in its incorporation of the historical (diachronic) dimension; systems development is seen as unfolding events in which one stage leads accountably to the next. According to Mohr (1982) and Van de Ven & Huber (1990), the process approach focuses on the dynamics of social change, explaining how and why the results of development efforts are achieved.

b) Process Model

Implementation as a "process" is an alternative approach to that of the "factors", even though much early work in this area was based on rather rigid models that see process as consisting of distinct, sequential stages. Srinivasan and Davis (1987) argued that this view is obsolete for contemporary CBIS, since the sequential handling of issues does not adequately capture the complexity of the dynamics of change in such areas as user-developer interaction. They proposed alternatives to the process model approach based on the centrality of users in the contemporary development of computerised systems. They characterised implementation as encompassing the vision of creating an environment in which a diverse array of users has convenient access to the necessary training and support needed as development

tools to carry out implementation tasks either on their own or through intermediaries. This view is quite similar to implementation with a user-centred focus (Lucas, 1981).

The process research stream has focused on the development of a project. Studies have focused on issues such as the relationship between designers and users, and the impact of a system on the organisation. Process models provide the "story" that explains the degree of association between predictors and outcomes. Thus, ISD is conceived as a sequence of events that occurs over time. For example, the factors of user involvement or top management support assume dynamic properties when conceived as processes. They can become ingredients in a realistic political drama, pitting analysts against users or top management against lower levels. According to Kling (1987) and Markus & Robey (1988), a positive feature of process models is their faithful account of actual experiences, although they can become cumbersome and analytically complex. However, the process research stream has achieved only limited success. Keil (1991) says that the most important finding is that the process matters:

> Implementation is not simply a matter of deploying a technology that "work." It is a process of organizational change that requires conscious management attention. How the process is managed can effect the outcome (p.17).

Process models accept the complexity of cause-and-effect in interactions of the various factors involved in a particular process. However, in terms of a practical approach, the number of factors need to be restricted in some way, so that a practical analysis can be undertaken. The analyst examining a particular situation may be able to predict that a particular outcome is likely, and other outcomes are unlikely. Although such predictions are not accurate in mathematically exact cause-and-effect terms, the process theorist may be able to establish meaningful associations between the various factors involved in the process of IT implementations and organisational change.

c) Systems Thinking Model

As we have seen, much of the criticism levelled at the implementation model focuses on the model's assumption of a static environment. By contrast, open systems theory recognises that no system under consideration is shut off from its surroundings. The understanding of how a system actively relates with its environment is, of course, extremely relevant to the analysis of organisations. Consequently, open systems theory, loosely referred to as the systems approach, has proved during the past few decades to be perhaps the most influential school of thought in management theory.

Systems thinking is founded on the idea that entities have emergent properties, which are not properties of any individual constituent, and that the whole is greater than the sum of its parts. The whole is conceived as a "system", with an internal coherence, which makes it meaningful to draw a boundary distinguishing it from its environment. Anything that crosses the existence of a system boundary defines itself as "inputs" or "outputs". Any system is, potentially, a member of a hierarchy of such things - it may contain sub-systems and itself be a part of wider systems. Maintenance of a hierarchy of systems open to their environment entails a set of processes in which information is communicated for purposes of regulation or control (Checkland, 1981).

Systems theory has been of enormous value and importance in the study of IS, and several research frameworks have been put forward using it as a basis.

- **The Ives *et al.* Framework**

The Ives *et al.* (1980) IS framework is a synthesis of many other frameworks and covers their main elements. This framework also helps us to explore and understand multiple features of the IS and their environments, as well as IS problems and their potential solutions. A pictorial model of the framework showing its main

components and their interactions is presented in Figure 2.2. The main contents of each model component are presented in Table 2.1.

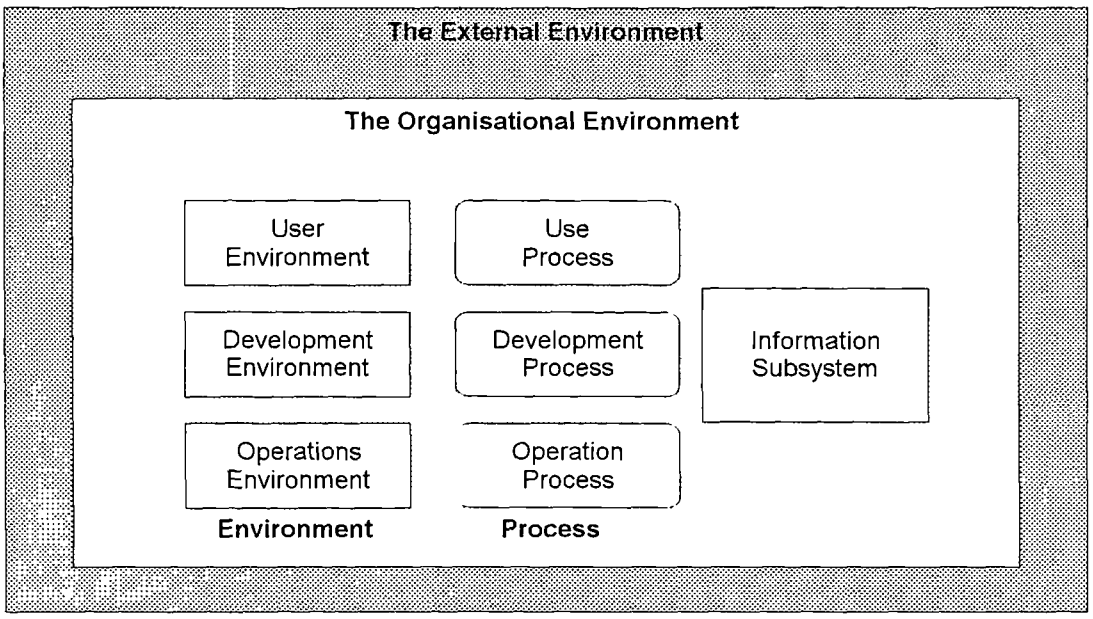

Figure 2.2 Ives, Hamilton & Davis's Framework

The model distinguishes among three IS environments, viz:

- User
- IS development; and
- IS operations environments (represented by squares) and

three information systems processes, viz:

- use;
- development; and
- operations processes (represented by ellipses).

These environments define the resources and constraints that dictate the scope and form of IS and IS processes. The IS processes comprise dynamic interactions among the IS, IS environments, and other IS processes. The IS, their environments, and IS processes are surrounded by two more extensive environments: the organisational and external environments. All these elements are called IS context components.

Table 2.1: Components of the Ives *et al.* IS Model

Component	Content
The Information System	The system that processes information; characterised by content, form, and time of presentation
IS Operations Environment	Resources necessary for IS operations; components include software, hardware, database, procedures/ documentation, organisation, and management of IS operations
IS Development Environment	Development methods and techniques, and their characteristics, design personnel and their characteristics, and the organisation and management of IS development and maintenance
The User Environment	Primary users of the IS such as decision-makers and intermediaries
The Organisational Environment	Organisational goals, tasks, structure, volatility, and management style and culture
The External Environment	Legal, social, political, cultural, and economic resources, educational, and industrial/ trade considerations
The Use Process	Use of the IS by the primary user
The Development Process	The selection and application of organisational resources that yield the IS
The Operations Process	The physical operation of the IS, which is primarily a function of the operations resource

- **The Ein-Dor and Segev Framework**

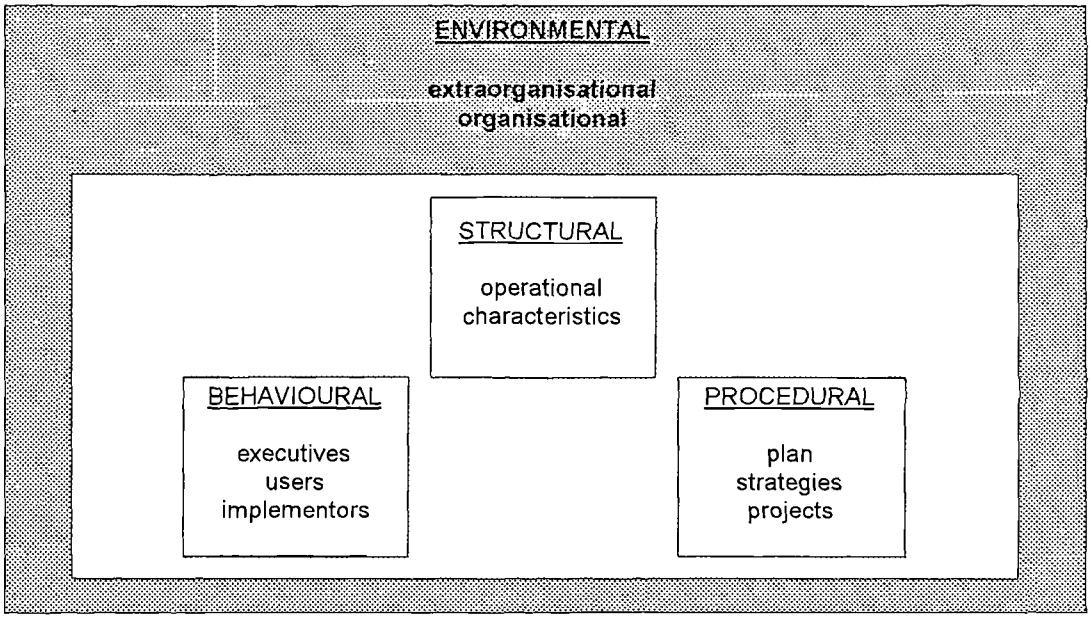

Figure 2.3: Ein-Dor & Segev's Framework

The framework presented by Ein-Dor and Segev (1981) depicts the relationship between a number of subsystems, as shown in Figure 2.3. These subsystems are defined in Table 2.2.

The Ein-Dor and Segev framework outlines a number of subsystems that inter-relate to create an environment, which impacts upon the success or failure of the IS. In their framework, Ein-Dor and Segev present a thoroughly comprehensive view of IS. They introduce specifically the aspect of "executives". Propositions are outlined, as shown in Table 2.3, which relate specifically to activities of senior executives.

Table 2.2: Components of the Ein-Dor & Segev MIS Subsystems

Component	Content
Environmental	This subsystem determine the limits of what can be done in developing MIS and shapes the form of what actually is done. It is characterised by such variables as prevailing technologies, availability of resources, organisational size and maturity, attitudes towards MIS, and perceptions of MIS.
Structural	This subsystem is the interface between the people and activities. This subsystem represents the physical system that is the end product of the procedures adopted. It includes data characteristics, user interface characteristics, mode of operation, and integration.
Behavioural	This subsystem encompasses users, executives, implementors, and the network of interrelationships between them. Within this subsystem are worked out the group dynamics and interpersonal relationships that affect the development and success of MIS. "Executive" refers to the ranks of senior executives involved in MIS and the roles they play for their association with MIS, the function they perform, their capabilities concerning MIS, and their relationships with other groups of employees involved in MIS. Users of MIS are the rank of users, their characteristics, capabilities, and education, their behaviour as users, and their relationships with other human elements of MIS. Implementors of MIS are the managers, analysts, programmers, and operators who compose the staff responsible for developing, operating, and maintaining MIS. They can be discussed in relation to their functions, recruitment, turn-over, organisation, capabilities, and relationships with other relevant personnel.
Procedural	This subsystem includes the procedures and mechanisms whereby overall organisational goals are successfully detailed and operationalised to the point where a system is finally coded and brought into use.

Table 2.3: Propositions Related to the Senior Executives' Role

Variables	Propositions
The Steering Committee	Steering committees composed of high-level corporate officers enhance the likelihood of MIS and MIS project success
Association With MIS	High levels of top management association with MIS increase the likelihood of success The level of involvement of top management is dependent on their appreciation, understanding, motivation, and perceptions of MIS High levels of manager-MIS association promote mutually favourable perceptions between IS staff and users, and commonly favourable perceptions of IS
Rank of Responsible Executive	The likelihood of a successful MIS effort declines rapidly the lower the rank of the responsible executive, and is virtually negligible more than two levels below the chief officer of the particular organisation the MIS serves
Functions of Top Management	The level of association of top management with MIS is related to the amount of time devoted and to the number of functions performed
Capabilities of Top Management	For a given level of top management association, the degree of MIS success is related to the level of skills acquired by the management involved
Leadership	The higher the level of managerial and interpersonal skills of MIS executives, the greater the likelihood of MIS project success
Top Management-Implementor Relations	The more rigorous the controls established by top management over MIS staff, the greater the likelihood of success of MIS projects The better the communications between top management and MIS staff, the greater the likelihood of MIS project success

- **Contingency Theory**

An approach that is more closely related to IS research and more influential in its application to IS than other approaches previously considered, is the contingency theory of organisation pioneered by Burns and Stalker (1961), Woodward (1965), and Lawrence and Lorsch (1967). Viewed from the contingency angle, the effectiveness of IS may be judged according to how well adapted they prove to be to the environment with which they interact. It is asserted that the choice of any particular method, format, or design procedure for IS must be contingent on the specific nature of the problem or situation which it is chosen to deal with. A contingency theory seeks to specify

particular characteristics, alternatives, and criteria for selection. Indeed, a good deal of current management practice and consultancy prescription with regard to IS is arguably based on the contingency theory approach. Thus, for example, a standard MIS textbook (Davis & Olson, 1984) enumerates the elements of a contingency approach as: (1) selecting an application development strategy, (2) defining the application level requirements, (3) establishing organisational requirements, and (4) organising project management.

Continued research efforts have been unable to produce robust guidelines for ISD. Despite apparent similarities in task, structure, and environment, organisations seem to resist the rigid categorisation of contingency theory, exhibiting disturbingly different characteristics (Walsham, 1989). The social elements of organisation are important determining factors.

- **The Socio-technical Theory**

Developing out of an increasing concern for the human aspects of working life, which were being neglected, the socio-technical theory attempts to jointly optimise the technical and social aspects of a work system. Mumford (1987) stated that the socio-technical theory encourages the emergence of alternatives to bureaucratic organisation. It aims to enhance productivity and learning by increasing participation in decision-making and individual control over the immediate work environment. The socio-technical approach is based on consensus and common goals, and is consequently ill equipped to handle politics and conflict. Truly participative design requires that management and computer professionals are confronted with workers' perspectives. This will raise questions of power, rewards, and values. Recent developments in systems thinking emphasise "soft", qualitative issues and multiple perspective (Checkland, 1981; Mitroff & Linstone, 1994). Soft systems methodology has been used in IS design (Wilson, 1984) and there are often other applications (Checkland,

1988). The soft systems approach is a hybrid between traditional systems theory and a more interpretative methodology.

d) The Interactionist Model

Recent years have witnessed a shift in the debate concerning the relationship between IS and organisations (Blackler, 1988). Attention has moved from computers as tools of automation to people-computer interactions, from regarding IS as straightforward tools to viewing them as schemes for human relations, from assumptions of rationality in those involved in ISD to awareness of the importance of organisational politics, and from a narrow focus on cost cutting to a broader concern with added value and general benefits to the organisation. This shift in conception reflects the synthesis of technical and organisational aspects of IT's effects; it is no longer a case of either technology or organisation, but rather of bringing both into an interactive picture. This enhanced profile of organisational factors alongside the technical factors (Land, Mumford, & Hawgood, 1980) arose gradually as problems increased with the conventional systems' life-cycle approach to IS design and implementation.

Keen (1981) emphasised that the design and implementation of IS is not merely a technical, but also "an intensely political", process. This being so, it becomes necessary to embark on the organisational change inherent in the introduction of CBIS with the aim of "coalition building". Keen saw that staff analysts, without formally recognised authority, could too easily be caught in the middle of conflicts that they could not control; what was needed therefore was managers with recognised authority and the necessary resources for engaging in negotiations. The tactical means of defusing conflict he envisaged as including the granting to the implementer of a clearly stated contract for change, direct response to resistance using person-to-person

encounters, working hard to obtain recognition as an insider of credible character, and the early co-option of users.

Markus and Pfeffer (1983) took a similar political view of the implementation process in accounting and control systems. They reasoned that if the implementers' perceived aim is to maximise the system's success while minimising resistance, they would need to design the systems in such a way that they remain in harmony with the established power distribution and culture of the organisation. If, however, the perceived aim is to achieve radical change in the organisation, then all sources of resistance and the programme for implementation in the organisation need to be tackled head-on. To achieve this purpose, they argued, it will be necessary to utilise a variety of tactics and political strategies, including self-education in the existing power structure; the cultivation of other relevant personal characteristics; the ability to argue one's position in a cogent manner using available information, in particular making careful use of politically potent language; and the ability to establish coalitions between individuals or parties cherishing different interests.

While Markus and Pfeffer dealt primarily in their article with political aspects of organisational change, they also drew attention to problems of cultural clash in CBIS implementations. In illustration of this, they recounted a failed attempt to set up a CBIS in the cardiology division of a major teaching hospital. The potential users of the IS were schooled in the ethos of clinical care, but the design of the system was approached from the viewpoint of statistical epidemiology; frustration and dissatisfaction were the inevitable results. The conclusion that Markus and Pfeffer drew from this case and other similar cases was that attempted implementations of CBIS would be doomed to failure if they did not take into account the symbolic power distributions and cultures at work in the organisation. No amount of participative strategies could bring the implementation on course if these were disregarded. The conclusion is that high levels of implementation success, as measured by stakeholder

satisfaction or practical effectiveness, can only be achieved through the creation of new social structures.

In agreement with the observations of Markus and Pfeffer, Wilcocks and Marks (1989) also emphasised how IS implementers must not ignore matters of cultural and political change. Their focus was on the lack of training given to those responsible for the implementation of CBIS in the UK's National Health Service. Drawing attention to the need for such training, they suggested that the implementer's role should be conceived essentially as a supportive one, assisting users to operate IT-based systems effectively in their work. Their approach was, on the whole, from the general management position and it has to be admitted that this is only one position in the fiercely political climate that surrounds organisational change in the National Health Service, yet it is worth noting their conclusion that, in order to make IT serve their purposes, successful general managers must recognise and respond to different groups' and individuals' objectives in the organisation if they wish to gain political and cultural support for the implementation of IT and the objectives they perceive to be obtainable through its use.

Land, Le Quesne, and Wijegunaratne (1989) considered quite a different area of implementation research, looking at implementation in four different organisations of the Integrated Project Support Environment (IPSE), which was a new computer-aided software engineering tool intended to improve quality in the software development process and to boost productivity. While the research took a somewhat static view of the implementation process, it nevertheless succeeded in identifying the factors involved which are mainly related to the cultural aspects of the organisation. These factors included the motivation for installing an IPSE, the organisation's commitment to it, the prevalent culture of the organisation, the management style, the process of implementation, and the organisation's experience and familiarity with standard ways of working.

The political aspects of implementing a material requirements planning (MRP) system in a medium-sized manufacturing firm were analysed in depth by Kling and Iacono (1984). An interesting finding of this research was that political campaigns in the organisation are not limited to the period of implementation or even the period immediately following implementation, but that campaigns and conflicts of a political nature may continue throughout the whole lifetime of the CBIS. Kling and Iacono noted how key actors will try to win support for the MRP system by different means. They may manipulate structural arrangements for the allocating of computer resources, they may conduct campaigns of "ideological training" on the virtues of the system, or they may perhaps attempt to quiet opposition by strategies such as the establishment of an authoritative decision-making body to which they may later co-opt a person responsible for microcomputers in order to assert control over the spread and development of microcomputing. Reflecting on these strategies, Kling and Iacono questioned whether such "politics of control" were actually required for the effective implementation of large-scale CBIS, and whether "ideology" is always necessary to lend purpose to and mobilise support for the introduction of computerisation in an organisation.

Walsham (1993) using three case studies, synthesised the nature of IS implementation into a unified view of the nature of IS implementation and the role of the IS implementer. The nature of IS implementation includes:

- a process of social change over the whole time from system conceptualisation to post-implementation;
- implementation actions and activities aimed at producing new social structures, involving such aspects as the nature and importance of new work activities;

- inevitable ambiguity in IS strategy, requiring a creative autonomy on the part of implementation agencies; and
- effective organisational implementation of large-scale IS, which may require coalition building, ideological training, and political tactics.

On the other hand, the IS implementer has a key role throughout all the interconnected activities of strategy formation, evaluation, and design and development. The IS implementer needs personal skills and a knowledge of political tactics as facilitator in the process of cultural change and, as a moral agent, he[6] must emphasise ethical choices concerning organisational change - a role that cannot be avoided.

In summary then, it can be seen that, while many studies have been completed and a variety of theories of implementation have been suggested, no one theory of implementation has been widely accepted (Kwon & Zmud, 1987). While some progress has been made, each of the models is rather narrow and highlights only a particular aspect of IS implementation. No one model provides an overarching framework within which IS implementation research can proceed.

Even less emphasis has been placed on the study of the role of senior executives, their impact on CBIS implementation processes, and the design of frameworks for use in exploring and understanding these impacts. The relationships between the activities of senior executives and the impact on CBIS implementation processes and outcomes is discussed in the following section.

2.2.2 The Overview of Senior Executives' Work

Reviewing the literature on senior executives' work makes us become more conscious of the implicit models they have regarding executives' functions. There is no

[6] The term "He" used in this thesis may also refer to both male and female gender.

position in the organisational hierarchy that is less understood than that of the senior executives. Senior executives' behaviour contributes to the culture of an organisation. Some researchers have concluded that strong leaders are the force behind the creation or change of an organisational culture. Entrepreneurs or organisational founders influence the culture of an organisation. They infuse their organisations with the values they have inherited from prior socialisation as well as from their professional experience. Because of their role as leaders at a critical juncture in an organisation's development, they are able to shape an organisation's culture in a unique way (Narayanan and Nath, 1993).

Mintzberg noted that an executive uses the information he collects in four ways: (1) to spread it to others, (2) to develop value positions for the firm, (3) to identify business problems and opportunities, and (4) "to develop mental images- 'models' of how his organisation and its environment function..." (Mintzberg, 1973). A mental model is "a cognitive construct" that describes a person's understanding of a particular segment of the managerial world (Carroll, 1985). McCaskey (1982) stressing that all of us live in a complex world that we need to simplify and organise if we are to manage effectively. Mintzberg not only recognised the importance of mental models, but also recognised the potential for enriching these models by exposing the manager systematically to the best available conceptual understanding of the situations he faces.

Isenberg (1984) argued that "managerial cognition" is a critical variable for understanding the management process. He pointed out that unfortunately almost all the major studies of executives' work have treated cognitive abilities as a background issue. One reason for this lack of attention to cognitive abilities is that there is no single well-accepted cognitive view of management.

Rockart and DeLong (1988), contended that almost all existing studies of senior executives at work have been based on small samples or have covered limited

periods of time, or both. According to them, what top managers do remains a mystery. However, Hart and Quinn (1993) have categorised the roles and behaviour of senior executives into the following three domains: 1) senior executives as dynamic vision-setters, 2) senior executives as networkers and boundary-spanners, and 3) multidimensional views.

The views of senior executives as dynamic vision-setters has been well developed in the sociology and political science literature (Conger and Kanungo, 1987). Theory and research in this domain emphasises the following three roles for the senior executives: (1) recognising the need for departure from the status quo, (2) creating and articulating a compelling vision or "agenda for change", and (3) institutionalising the vision through consistent personal example and organisational design.

The external boundary-spanner role has been captured more recently in studies of "executive scanning behaviour" (Daft, Sormunen, and Parks, 1988; Jackson and Dutton, 1988). This stream of work has shown environmental scanning to be an important factor in both problem definition and organisational effectiveness. Studies by Kotter (1982) and Kaplan (1984) confirmed the importance of external communication networks to general managerial success, but also emphasised the important of internal networks. In both studies, effective senior managers displayed a broad knowledge of the industry. Gupta and Govindarajan (1984) and Govindarajan (1989) demonstrated that experience in general management and extensive industry experience contributed to executives' effectiveness regardless of the corporate or environmental context. For executives' roles and behaviour, this involves building extensive external contacts for information gathering and environmental scanning.

Whereas the first two categories of literature on senior executives are composed of studies and models that focus on a particular set of roles, there is a body

of literature that examines the phenomenon from a multidimensional perspective. Druker (1973) summarised this well by observing that the senior executive must function simultaneously as "a thought man, an action man, a people's man, and a front man." Mintzberg (1973, 1975) in his landmark study of five chief executive officers (CEO)s, identified ten roles of executives within three main categories, as follows:

- Inter-personal roles; figurehead, leader, and liaison.
- Informational roles; monitor, disseminator, and spokesman.
- Decisional roles; entrepreneur, disturbance handler, resource allocator and negotiator.

Mintzberg (1975) went on to observe the ten roles form a gestalt, an integrated whole, and that leader effectiveness hinge on fulfilling all the roles simultaneously.

a) The Competing Values Framework

Value systems might be understood as "what matters most" to the stakeholder or the organisation, itself. Personal values or organisational values are abstractions but necessary to provide a focus for action and intentionality. In addition, value systems might be regarded as mental models of the contextual elements of real world situations. Some aspect of reality is valued more than another. The researcher creates mental models of the research work, but will change his mental perceptions if real-world situations, which are facts, dictate that a change of perception is required in order that the researcher's perceptions more accurately reflect real-world situations.

The implication is that the facts come first, the perception of which create value systems, which depend on the experiences and disposition of the individual. It may happen that a stakeholder may cling to a value system despite the dictates of real-world situations. This is a negative response and indicates a refusal to face up to reality. As a

short-term strategy, such responses might be acceptable as in the case of maintaining an optimistic outlook in the face of opposing events. In the longer-term, however, such responses may be invalid because reality and the reality of real-world events can be very unforgiving of errors in perception. These arguments imply that if values can be changed to the more in line with reality, then intentional actions are likely to have a greater probability in generating successful outcomes. Organisational values exist in the same way that personal value systems exist. An humanitarian organisation may hold value systems that are different to other types of organisation.

The research problem is in identifying the type of values that are held by stakeholders. A stakeholder who has strictly ethical values may experience pressures to act in a way that are not in accordance with personal conviction. Frameworks have been evolved from empirical studies in relation to the study of organisational effectiveness. The competing Values Framework (Quinn & Rohrbaugh, 1983) is shown in Figure 2.4. The framework represents a structured formulation of a series of mutually exclusive value systems.

HUMAN RELATIONS MODEL	*Flexibility*	OPEN SYSTEM MODEL
Means: Cohesion; morale **Ends:** Human resource development *Internal Focus*		**Means:** Flexibility; readiness **Ends:** Growth; resource acquisition *External Focus*
Means: Information management; communication **Ends:** Stability; control		**Means:** Planning; goal setting **Ends:** Productivity; efficiency
INTERNAL PROCESS MODEL	*Control*	RATIONAL GOAL MODEL

Figure 2.4.: The Competing Values Framework

- **The Internal Process Model**

The characteristics of the Internal Process Model is shown in the lower left quadrant of Figure 2.4. Most valued in this type of organisation is the traditional notion of hierarchical structure. Organisational values tend to have a modelling effect on stakeholders throughout the structure.

Strategically, information and control systems are valued. Procedures and formal channels of communication are emphasised with the intention of generating an environment that is characterised by stability and control. Job roles and work practices are well-defined and stakeholders are expected to follow the norms and rules that are embedded in the sequential procedural steps.

Such types of organisation are characteristic of IT departments that operate in organisations that are characterised by stability, predictability, and co-operative in the implementation of procedurally-oriented systems. Managers are expected to be well-informed on the activities in their sphere of influence. Typically, a manager is expected to monitor activities and results in line with pre-determined plans, budgets, and timescales. The manager will invest time in scrutinising the details of reports and investigating any variances that are identified between planned and actual performances, and is, typically, expert in the quantitative analysis of organisational information and monitoring of departmental activity.

As a co-ordinator, the manager is likely to approach organisational cohesion using analytical thought processes and dislikes disorganised thinking and information. The manager's self-perception is one of "custodian" and "regulator" and tends to act to maintain and facilitate improvements in the quality and reliability of work practices by scheduling, reviewing, co-ordinating staff activities, and making personal intervention in situations where staff need advice and support. The manager would have a genuine

interest and involvement in technology issues and perceive the technology as offering the opportunity for making a valuable contribution to departmental and organisational effectiveness.

- **The Open Systems Model**

The characteristics of the Open Systems Model are shown in the upper right quadrant of Figure 2.4, and contrast the characteristics of the Internal Process Model. Organisations that exhibit the qualities of the Open Systems Model place an emphasis on adaptability, creativity and innovation. Such organisations recognise the need "to make the future happen" by abandoning today's ideas and seeking to do something new. There is a recognition that "creativity" and "innovation" as traditionally understood is not the problem. There are more ideas in any organisation that can be put to use, but such ideas are unlikely ever to come to fruition, because of a personal unwillingness to commit to the new, possibly revolutionary, value systems that are the end result. Stakeholders in Open Systems Organisations are able to adapt to the expected outcomes. Stakeholders understand that issues of "market testing", "economic viability", "organisational resources" and traditional organisational thinking is mechanistic, and can be left to others. In contrast to this, stakeholders focus on intuition, imagination, adaptability, visionary commitments and drawing in external resources. An example of drawing in external resources is when the editor of some publication, which might be a national newspaper or even a student's magazine, induces an otherwise unapproachable politician to contribute to the publication. The politician can be a valuable resource in promoting the publication. The politician contributes freely because the politician believes in the vision or the cause espoused in the publication. The Open Systems stakeholder has little doubt concerning the outcome, because the stakeholder is committed to it.

A manager is expected to be an innovator and facilitate invention, originality and change. The manager relies on induction, ideas, high levels of abstraction, and intuitive insights. He absorbs information based on external focus and from a variety of sources, often seeking trends and summary information that cuts across different knowledge areas. In line with his role as an innovator he feels that some information is "right" and other information is not relevant. By accumulating large amounts of information that feels relevant, he can mentally scan across this information, while pondering some idea, seeking the "right" solution. In effect, the "right" solution represents the highest probability of "best-fit" solutions from the many alternative solutions that occur to him during the scanning process. In effect, he is using a system of "brain-storming", but in a non-mechanistic and fluent manner. It is unlikely that he attempts to verify intermediary conclusions. If some conclusion feels right, he will develop further conclusions based on this and only test the ultimate conclusion that seems to fulfil the original objective.

The manager is expected to draw in resources from the external environment and acts as a catalyst or a broker in drawing in resources that support the objectives of the vision, which involves some creative attainment and materialisation of his innovative thinking. The manager will concerned with image, persuasion, influence, political awareness, representation of ideas and visions, issues of control and power, and political lobbying.

- **The Rational Goal Model**

Organisation that are characterised by the Rational Goal Model understand the need to generate profits, which are the acid test of purposeful activity and the most valued attainment of their endeavours. The assumption is that production needs to exist to create products which generate profit, and an increase in production generates

an escalation of profit. Production is the heart of the business, without which there would be no business.

This rational notion does not uniquely apply to production in a manufacturing sense, but to productivity of the organisations resources in whatever sector the organisation operates. The organisation may be a service organisation, but the principles of productivity and efficiency generating tangible results still applies. The belief is that problems and setbacks are a force of "production" can overcome any obstacle, provided stakeholders are sufficiently determined, committed, and rewarded for achieving results. Achievement reflects the stakeholder's worth, and non-achievers are considered worthless and unnecessary overhead to the extent that the stakeholder is likely to be dismissed.

A manager in this type of organisation will accept his own responsibilities to direct and to produce. He will define role, tasks, and timescales and adopt methods that promise increase productivity. These may include techniques such as management by objectives, activity analysis and time management, employee suggestion schemes focused on productivity realisation and gains, and overly regular staff interviews and appraisals.

The manager is expected to have a high level of staff-motivation, drive and endurance and maintain a high level of personal and departmental output. By this means, the organisation can best ensure its survival and provide the basis for increases in economic performance and a greater sense of security in a competitive world.

- **The Human Relations Model**

The Human Relations Model emphasises the value of human resources and the potential for contribution to organisation success that can be made through cohesive

efforts. The perspectives of different stakeholders are recognised and attention is given to participative decision-making and the formulation of a consensus of views before management plans are fully adopted and implemented. There is a focus on creating the right conditions for individual and organisational attainment. This involves the principles of ethical management and the provision of adequate staff training and infrastructures.

A manager is expected to act as a facilitator and mentor, and create an awareness on how and in what way each individual stakeholder can make a contribution to a collective effort and, at the same time, fulfil individual aspirations. The manager is process-oriented and is involved in activities that are aimed at providing individual stakeholders with the opportunity of mapping reality more closely. The objective is not to attempt to create or interfere in issues of personality traits but to act as a mentor in encouraging stakeholders to take into account the reality of cohesive effort despite personal apprehensions and preferences.

The manager needs to unbiased and accept that he, himself, can learn from the experiences of other stakeholders. Stakeholders need to be encourage to explore the reasons why other stakeholders hold different views. If this is done in an atmosphere of hostility the views of different stakeholders are likely to diverge even further. The manager needs to encourage the ethical exchange of views of stakeholders and attempt conflict resolution.

The manager realises that, in educated societies, people have become more equal in their knowledgeability and that the archetypal symbolism of "master and slave" only catalyses perceptions and is not representative of evolving real-world situations. The manager does not live in a dream world, he faces and accepts reality as a serious issue. He takes action that fits the needs of the situation. At the same time he passes on

his knowledge and skills to other stakeholders and makes contributions to their own individual development.

- **The overall Framework**

The Competing Values Framework was so named because of the mutually exclusive nature of the characteristics contained in the diagram. It is apparent that the abandonment of today's ideas and the reliance on induction, innovation and intuitive insights of the Open Systems Model excludes the characteristics of the systems "custodian" and systems "regulator", and step-wise operations that characterise the Internal Process Model. The framework seems to carry conflicting messages that are divergent, with no recommendation as to which is the most appropriate in a particular situation, except through the exercise of subjective judgement.

Organisations operate in real-world situations and need an appropriate basis by which they can achieve successful outcomes in their operations. The implication is that the nature of reality needs to be understood before effective use can be made of the framework. There are aspects of reality which can be scientifically shown to remain constant. For example, the nature of gravitational effects indicates that the world we live in is more structured and more predictable than we can imagine.

On the other hand, other aspects of reality appear to change, or, at least, cause changes to take place. For example, a stable and profitable organisation may suddenly experience unexpected difficulties. In such situations it may not be clear, and no amount of analysis can determine, what cause-and-effect aspects of the real-world structure has changed or caused some unforeseen change to take place. Despite the psychological reflections on the nature of reality, the fact remains that change has taken place, and can be observed to have taken place. The change is characterised by a problem situation which can and must be analysed.

The nature of the problem situation gives an indication as to which aspect of the Competing Values Framework is most appropriate in providing solutions to the problem situation. By the same argument, a longitudinal analysis of an organisation's experiences can be used to show whether the value systems adopted by the organisation were appropriate to the organisational objectives over a given time-frame. However, because the world keeps changing, and strategies that were effective yesterday, may not be effective tomorrow, the implication is that different strategies need to be adopted in different situations, and that there needs to be a flexibility in strategic management designs.

While the characteristics of the different models are mutually exclusive in theory, reality demands that the validity of every model needs to be taken into account in the process of organisational management and effectiveness. An historical analysis of organisational experiences may indicate that management style is skewed heavily towards one of value-system models. This polarisation towards one particular value-system may not represent a valid longer-term strategy in managing the effects of real-world change.

If effective management is to be promoted, there needs to be a recognition by managers that competing value systems are not mutually exclusive in the real-world. Also, stakeholders may be characterised by a polarisation towards one particular value-system, although this is not to say that value-system characteristics are mutually exclusive in the mind of the individual.

Because of role-play, it may be difficult to establish the characteristics of the value-system held by the individual stakeholder. Even so, value-systems influence individual perspectives and behaviour, and are interlinked. This argument provides a

validity for researching individual perspectives and behaviours by means of questionnaire surveys and case studies.

A fundamental theme and objective of this research work is to understand the role of senior executives and the effect on organisational effectiveness, particularly in relation to IS management. The use of Competing Values Framework in this research work contributes to an interpretation and understanding of management role and its effects on organisational processes, and provides a further contribution in the design of effective management strategies. Next section discussed the the Executive Leadership Roles Model which was originated from the Competing Values Framework.

b) The Executive Leadership Model

Hart and Quinn (1993) have produced an integrated model of executive leadership roles drawn from the various literature discussed above. The model consists of four quadrants representing "domain of action", entailing a particular demand on the firm, with a corresponding role for top management, viz: Vision Setter, Motivator, Analyser, and Task Master. The four domains of the model - the future, the organisation, the operating system, and the market - match the four quadrants of "the Competing Values Framework". The model proposes four competing demands which all top managers and executives face. These are: (1) Innovation (the future positioning of the organisation with strategic direction, products, and service), (2) Commitment (developing and motivating people and upholding a distinctive identity and value system), (3) Efficiency (managing continuing operations and the critical evaluation of alternative projects and programmes), and (4) Performance (fulfilling plans and achieving results in the market-place).

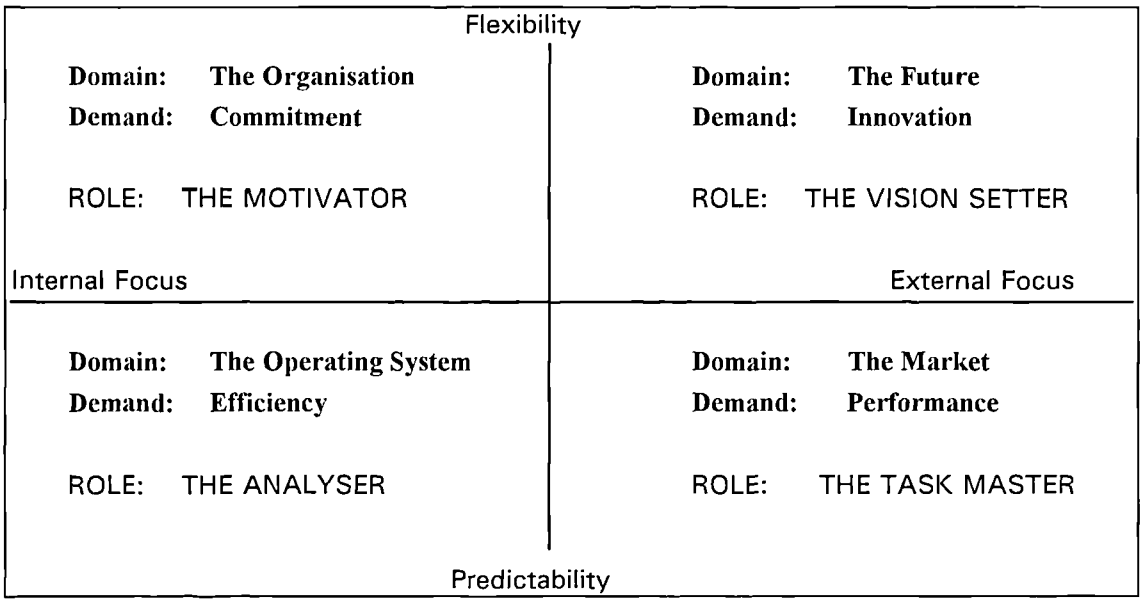

Figure 2.5.: Executive Leadership - a model of the competing roles (adapted from Hart and Quinn [1993])

Although senior executives may exhibit the attributes of more than one of the four fundamental leadership roles (Figure 2.5), there is a natural tendency towards a polarisation of these attributes, which are described as follows:

- The Vision Setter's role is one of creating a conceptual framework for the organisation. The concept is invariably one of "grand design", which is the result of inspirational thinking. Although initially abstract in concept, the strategy materialises in the promotion of a strong sense of organisational identity and mission. This type of thinking provides cohesion for the organisation as a whole, and contributes strength to the basic objectives and future direction of the organisation. More than any other type, the Vision Setter will invest time in examining the trends in real world data, which will encompass a wide area of interests in competitive and market analysis, technological developments, and changes in socio-economic conditions. There is an alertness and responsiveness to the weakest signals that may be picked up from informal contacts either from within the organisation itself or external to it. Such signals will be incorporated

into an interpretative scheme of analytical thinking and become part of the overall vision and future direction of the organisation.

- The Motivator role is fundamentally one of managing "meanings" and "significance". The most significant meaning for the Motivator on his scale of the perceived significance of organisational activities is people. There is a realisation that people are significant resources in achieving successful outcomes, and they need significant symbols to act as catalysts towards a sense of performance and clarity of purpose. Unlike the Vision Setter, the Motivator does not focus on a sense of mission, but imports the concept and contributes vitality to it. Thus, vitality creates a sense of urgency, excitement, motivation, and higher levels of performance. The significance of management policy is that it should be achieved and that it can be achieved through the actions of a highly motivated workforce involved in motivational activities expressed as a "cause worth fighting for", a "commitment to organisational objectives", and as a series of "mission statements".

- The Analyser role is one of rational thought by which one idea is logically associated with another, which contributes a system of structure and order, which are the foundations for an efficient system. Policy directives are converted into structures, which provide the context for functional activities. There is a natural antipathy towards disorganised thinking and systems, and the Analyser will probe deeply by asking difficult questions to establish the facts and promote rational compromise or force a new conclusion. Through the process of critical review, the Analyser can integrate conflicting perspectives and contribute to the fluency of organisational operations.

- The Task Master role is work-oriented and directed towards firm action by which obstacles can be overcome and objectives achieved. This contributes towards the

best interests of the internal and external "stakeholders" in meeting short-term economic objectives and in meeting the socio-economic needs of the community. The concern is for allocating resources to meet these interests and ensuring that objectives can be met within pre-set time scales through objective work practices, and by allocating resources to the highest priority tasks. By focusing on firm performance and visible results rather than focusing on other aspects of the management role, which may not provide the return on the organisation's investment in its human and capital resources, the executive may enhance the organisation's market position, particularly if the organisation is facing direct pressure from a particularly aggressive competitor. The executive can also contribute specific knowledge and experience in the use of resources and by noticing under-utilisation of resources or weak areas of performance.

The reviews of the four models highlight some of the important factors that contribute to the ideal organisation. In the first instance, organisations need to demonstrate structure and stability, without which very little is likely to be achieved. As the organisation develops, it must demonstrate its capability for flexibility and adaptability in response to changes in the real world. As growth takes place, additional resources need to be acquired, monitored, and controlled. This requires information management systems that accurately reflect what is happening and what actions need to be taken. Formal communication is needed to ensure that information flows are not erratic and that the right type of information reaches the relevant authority. There needs to be an emphasis on personnel as a long-term resource that can be developed. At the same time, there needs to be an emphasis on economic performance and achieving economic objectives.

Taken as a whole, there needs to be an ideal balance of these factors, which is impossible to achieve because of the complex and dynamic nature of organisations and the organisational demands for the mutually exclusive characteristics that contribute to

the ideal organisation. Because of competing roles, role conflict, complexity, and dynamic changes that take place within an organisation, a sensible approximation to the ideal organisation might be that the four management roles should be equally represented over a period of time. However, it can be concluded that an organisation that shows a skewing away from the norm, over a period of time, is not likely to approach the requirements of an ideal organisation.

Next section discussed the possibility of combining the Competing Values Framework/ Leadership Roles (Hart & Quinn, 1993) and the framework of archetypal IS practitioners' roles (Hirschheim & Klein's, 1989; Wood-Harper, 1985; Bell & Wood-Harper, 1992), which may help the researcher to improve his understanding of the conflicting worldviews of senior executives and IS practitioners.

c) Competing Stakeholders' Worldview

IS literature over recent years has drawn on the disciplines of sociology and psychology to create an awareness of the differences in worldview. Burell and Morgan's (1979) claim that each of the stakeholders holds philosophical assumptions about the social world and their behaviour in that world, led them to identify four paradigms and to state that each of them operates within just one of those paradigms. As a metaphor for understanding people's behaviour, this is powerful and has been used to address different roles that the people may assume when working in an organisation.

On the basis of the same principle, the Competing Values Framework has been used to map senior executives' leadership style and hence, the concept of work within their worldviews. Similarly, Hirschheim and Klein's (1989), Wood-Harper's (1985), and Bell & Wood-Harper (1992) framework of archetypal IS practitioners' roles has been used to represent the IS practitioners' worldview (Figure 2.6) that would

complement the overall framework. Eventually, a combining of both frameworks may help the researcher to improve his understanding of the conflicting worldviews of senior executives and IS practitioners, which is the main focus in this research.

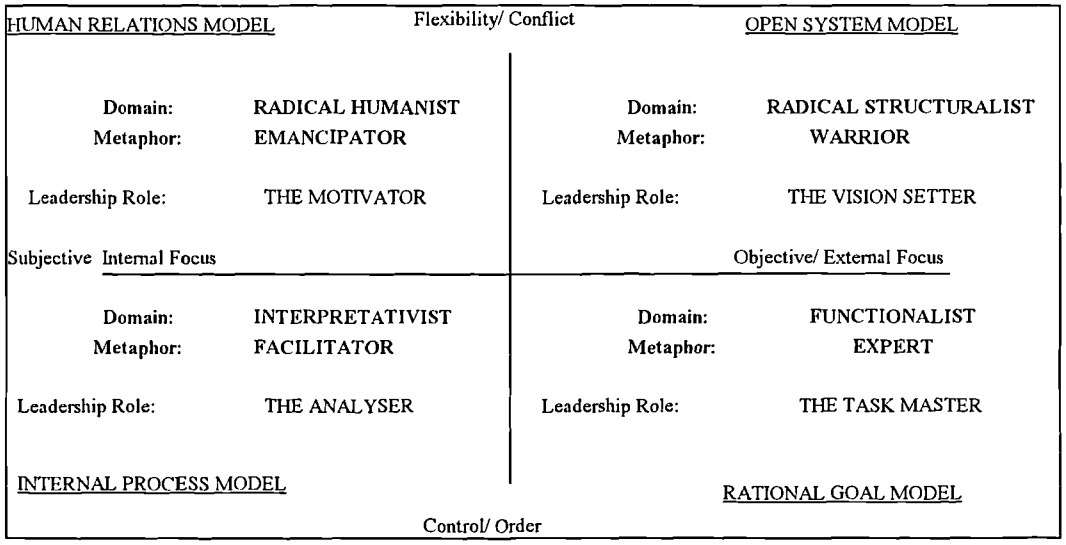

Figure 2.6: Framing the Stakeholders' Worldviews (adapted from Hirschheim & Klein [1989], Wood-Harper [1985], Bell & Wood-Harper (1992), and Hart & Quinn [1993])

There are two practical applications of this approach. The first is during participative interviewing when the analyst can adopt a particular role that is judged to be appropriate to the objectives of the interview. An instance of this might be during the early stages of analysis, when the analyst judges that the appropriate part to play is that of an Analyser or student of the situation, facilitating open discussion. The model adopted provides a focus and sense of direction for the interview, and tends to reduce the effect of any bias the analyst may have, by focusing on role play. Depending on the situation at the time, the analyst can adopt different roles during the same interview, where appropriate, and progress the interview in a focused and exploratory way.

The second application is to enhance communication between the analyst and senior executives. Senior executives need to understand problem situations in terms of their norms and interpretative schemes if effective communication, reflection, and

action is to be taken. By aligning himself with the worldviews held by senior executives, the analyst can participate more fully in the senior executives' perceptions and present situations, interpretations, and proposals in a way that will have impact on the participation and involvement of senior executives. The analyst is not attempting, and does not intend, to alter stakeholders' personality traits. However, the implication is that the value systems held by stakeholders can be influenced by meaningful communication, and such influences can have far-reaching effects on the level of socio-technical success achievable using existing and future technologies.

Even so, the research issue remains one of identifying an appropriate framework that can be used to investigate the interactions that occur, in CBIS implementations, as a result of the influences generated by senior executives. The following section reviews the key factors in choosing a suitable framework, and proposes a framework that is of generic value, and is specifically geared to meeting the analytical requirements of the research objectives.

2.3 CBIS Implementation Frameworks

To understand how IS functions in organisations depends on the network of social relationships, communication processes and information flow. ISD and use are inseparable from their organisational context.

Thus, to provide the link between the development and the context, two frameworks were used in stages. The multiple perspective approach was adopted by operationalising the Multiview methodology for development and the Multilevel approach according to Walsham's Analytical Framework, thereby enabling a wider discussion to take place, addressing the social, cultural, and political aspects, for the organisational context.

The proposed research project is also related to, and attempts to take into consideration, the multitude of components of the Ives *et al.* framework, specifically the external, organisational and ISD environment components, and the behavioural subsystem of the Ein-Dor and Segev framework. The following section discusses the relevant frameworks.

2.3.1 The Multiple Perspectives Approach

The concept of multiple perspectives is a remedy intended to overcome domination by the technical perspective, for the multiple perspectives approach includes two other perspectives: the personal perspectives of the individuals involved and the organisational perspectives of the social system in question (Linstone, 1981). This approach of using three types of perspective enables us to take into account individual and social values, and to introduce design participation of the actors and agents affected.

Further, the work of Mitroff and Linstone (1993) helps us to recognise that we now live in the world that is very "messy". They provide enough reasoning to suggest that, in today's world, economic success demands that one be able to examine problems from "multiple perspectives". This is encompassed in what is called Unbounded Systems Thinking. It is fundamentally a transdisciplinary inquiry system - based primarily on the multiple perspective concept and attempts to combine the "agreement", "analysis", and "conflict" into the technical perspective.

Linstone and Mitroff (1994) view the information explosion as potentially becoming on an international scale the new arena for human conflict. They comment, "The more our knowledge grows, the more complex we perceive the world to be" (p. 315). Conflict may, they assert, be obviated by setting human systems in the light of multiple perspectives. These perspectives they see as constellating around three poles: technical or analytic views, organisational or institutional prospects, and personal or individual insights. Each of these perspectives is of value in that it views a system through a distinct lens and offers perceptions not encompassed by the others. The technical or analytic perspective cannot be stretched so far as to claim ultimate mastery over systems so complex as the physical and social environments, yet because of its inherent rules of logic it is an essential requirement in any attempt to understand complex systems of behaviour. The organisational or institutional perspective recognises the necessity for continuous dialectic in order to ensure that any excesses of one structure pushed to extreme will be rectified by allowing due weight to others. The personal or individual perspective recognises that both the top-level dynamics and also the deep substructures of complex systems interact to shape differences, so that such systems may operate simultaneously in a moral framework, allowing due weight to both standards and individuals.

Linstone and Mitroff argue that what is important above all is that there be a deep interweaving of technical, organisational, and personal perspectives if messy

problems are to be unravelled. Moreover, this must be accomplished at a higher ethical level: "Ethical management implies the ethical integration of T, O, and P. It means simultaneous, balanced action: individually, in a moral way; technically, in a rational way; and organisationally, in a just way" (p. 342).

However, by recognising different forms of knowledge, the multiple perspectives approach is associated with practical difficulties. As a result of their backgrounds and traditions, people tend to select one particular perspective over other perspectives. For example, systems analysts are often happier when taking a technical perspective of a situation. Attempting to perceive the situation more broadly by selecting the organisational view while at the same time marginalising technical issues is not necessarily a better solution. The perspectives represent different knowledge interests and thus need to be considered jointly. There are no simple rules for balancing the requirements of different perspectives because they cannot be reduced in any meaningful sense to a single perspective, Indeed, the perspectives should be expected to produce conflicting requirements and this dissension used as a basis for discussion and action. Thus, in using multiple perspectives we need to be able to apply methods that reflect the different knowledge interests, to be aware of the limitations of different methods, and to use judgement to reach a balance.

In this study, the researcher intends to focus on a description of the CBIS implementation process, giving attention to the problems of interpreting the context in which the implementation takes place (an O perspective). Soft systems methodology (SSM) is one approach used to model the context of the implementation process. Aspects of the P perspective has been addressed by ETHICS method (Mumford, 1995), but in this study it is being addressed by using the Competing Stakeholders' Worldview, adapted from Hirschheim & Klein (1989), Wood-Harper (1985), and Hart & Quinn (1993). A development method that reflects all three elements of the TOP model is the Multiview methodology.

- **Multiview Methodology**

Wood-Harper (1989), Avison and Wood-Harper (1990), and Bell & Wood-Harper (1992) have incorporated components of SSM, i.e. the participative and structured methodologies, as a way of addressing the multiple dimensions of organisations and have developed the Multiview methodology. Multiview is not seen as a recipe but a paradigm for interpreting ISD in context. It is a contingency framework, introduced as an alternative to choosing between different methodologies or standardising according to one particular methodology. The techniques and tools available within the Multiview framework are chosen and adjusted according to the particular problem situation. It is a blended methodology drawing on aspects of each of the six themes discussed in Avison and Fitzgerald (1988).

The Multiview methodology incorporates five different views that are appropriate to the progressive development of an analysis and design project, covering all aspects required to answer the vital questions of users. These five views are an attempt to form a system that is more complete in both technical and contextual terms. The five stages are:

- Analysis of human activity
- Analysis of information (information modelling)
- Analysis and design of socio-technical aspects
- Design of human-computer interface
- Design of technical aspects.

In an attempt to use Multiview methodology and Multilevel analysis as a research approach within the multiple perspectives framework, and as a meta-

methodology for the CBIS implementation framework, the use of Multiview (Bell and Wood-Harper, 1990, 1992) is separated into two stages as follows:

- **Stage One: Problem Recognition Phase**

Root Definitions are the main images or metaphors utilised in the Multiview methodology. Root definitions are the high level abstractions of the salient features of human activity systems. In building these there is a construct remembered by the mnemonic CATWOE, which stands for Customers, Actors, Transformation, Weltanschauung, Owner, and Environment. In this study, the context of the CBIS implementation process is developed using the root definition that represents the organisational perspectives within the "organisational" and "external environment" of the Ives *et al.* Framework. The root definitions also include the personal perspectives of various stakeholders within the "behavioural" component of Ein-Dor and Segev's Framework, analysing their strength and weakness (e.g. leadership role, IS practitioners and users). Parallel to this stage is the reconstruction of the social context and social process of the organisation concern through Multilevel analysis to enrich the root definitions. Conceptual models are then represented in diagrammatic form derived from the root definition. Thus, the Human Activity Systems approach is used to explore situations by constructing systems models through root definitions.

The second stage of Multiview consists of Information Analysis. This is the analysis of entities, functions, and events. In the context of this study, this stage, which is parallel to the outcome of the Context-Process linkage of the Multilevel analysis, is used to further refine the earlier conceptual models.

- **Stage Two: Strategy Formulation and Implementation Phase**

The findings from the above phase are then being formulated into a strategy which incorporates the remaining stages of the Multiview methodology (i.e. socio-technical analysis and design, design of human-computer interaction, and technical aspects). Within the strategy that is being formulated, this stage also evaluates the capabilities of technical expertise available and appropriate methodologies or tools that can be utilised by IS practitioners for intervention in the above situations.

The model in Figure 2.7 depicts the multiple perspectives methodology. The manifold nature of the frames of reference incorporated in the model lends it advantage over traditional IS development methods and especially over other CBIS implementation methodologies. This is perhaps because of the very broad framework in which organisations are reviewed, in contrast to the narrow boundaries of other methodologies by which analysts and IS practitioners normally operate. The basic tenet of the multiple perspectives approach is that no single perspective is adequate to deal with complicated and sometimes chaotic situations. In addition to the various perspectives, this approach further recognises that there exist different kinds of knowledge which are not reducible to any common denominator (Flood, 1991). This being so, the methodology requires careful application in order to ensure that it takes account of the different knowledge concerns and achieves an efficient equilibrium.

As shown in the model, the steps of the method are not necessarily sequential, but more of a prioritised set of events that deliver results to and from one another in the interwoven coupling of activities. If we look closely at the model, we notice that the steps of the Multiview methodology are linked in a constant learning cycle (shown on the right-hand side of the model). In some ways, reflecting through the underlying doctrine of Multiview, this measure pulls together fragments and combinations of

traditional ISD techniques, with soft systems thinking being used as a means of revising conventional ideas.

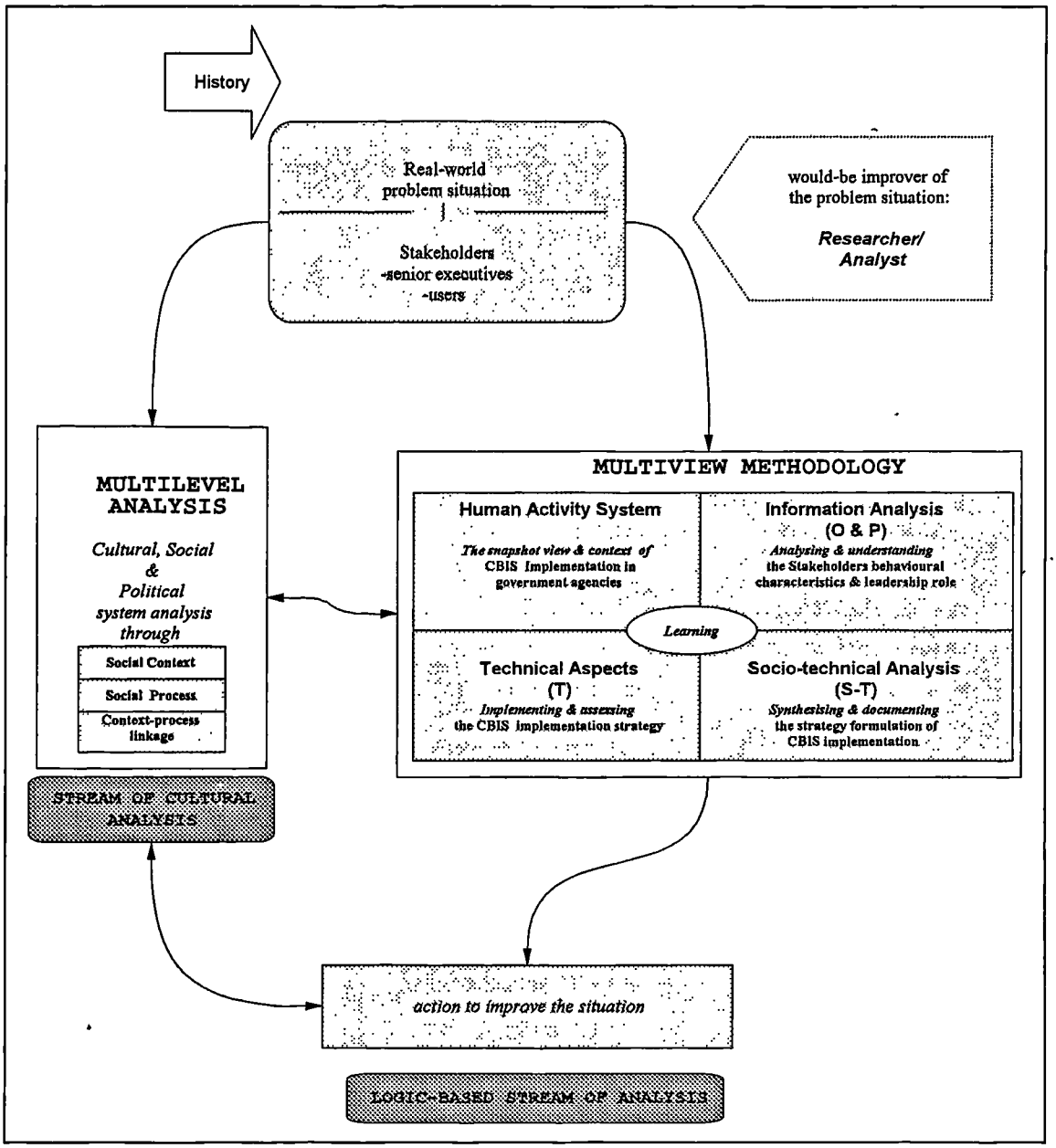

Figure 2.7: A Multiple Perspectives Approach to the CBIS Implementation Process (adapted from Wood-Harper & Avison [1992] and Bell & Wood-Harper [1992])

Other areas of the model are concerned with achieving an appreciation of the occurrence of the implementation process with Multilevel perspectives (left-hand side of the model). This examination centres on the Context, Process and Context-Process linkage analysis using Walsham's Analytical Framework.

In conclusion, the Multiple perspectives approach is based on the principle that it carries certain qualities and a level of asperity to the process of radical change that are presently missing. The next section will discuss the various components of Walsham's Analytical Framework.

2.3.2 The Multilevel Perspectives Approach

From the available frameworks that have been mentioned, several methodologies have been developed which provide various platforms or levels for research into the process of IS implementation. These include the Web Model (Kling, 1987), Pettigrew's Contextual Analysis (1985), and Structuration Theory (Gidden, 1976, 1979, 1984; Bryant and Jary, 1991).

- **The Web Model**

A different approach in determining the nature of the IS environment is that of web models. The web model has the additional advantage of defining, or attempting to define, the boundaries within which the IS should operate. Clearly, any organisation can become a bureaucracy, inflexible and inefficient. Even so, at the same time, the organisation can extend its control, in the case of large-scale IS, thus growing a culture of ineffectiveness and resistance to change in line with critical changes that may be occurring in the real world. Such procedurally driven organisations can develop to the extent of inhibiting further meaningful in-house systems. For this reason the web analysis focuses on social criteria rather than procedural criteria, and pays particular attention to the procedural constraints that exist within the organisation. In addition, the web analysis takes into account such factors as the social context in which the organisation currently operates and its own particular evolution. The objectives of the organisation are examined as they currently exist along with the accepted practices,

resources, social interactions, and political interests and influences that are being exerted. The work of Kling & Iacono (1989) has contributed much to the analysis of IS as dynamic social systems with the potential for change in line with greater effectiveness within realistic boundary conditions.

- **Contextual Analysis**

Pettigrew has also emphasised the principles of social interactions on a broad scale, so that this complex interaction can be seen in context. The process taking place can be seen as a result of these interactions and can, therefore, be accurately assessed and understood. The advantage of this approach is that it provides a basically simple and practical method for analysis of organisational behaviour - "there are three basic elements to a contextualist analysis: the process component, the context component, and the outcome component of the process under investigation" (Pettigrew, 1985). This principle can be applied to the existing organisation, taking into account phenomena that occur at different vertical and horizontal levels within the organisation. Vertical-level phenomena are interconnected and interdependent, and contribute to an understanding of the functioning of the organisation, when understood in context. They also contribute to an understanding of the hierarchical nature of the processes that exist in this area. In the same way, the horizontal analysis looks at the evolution of the organisation and the interconnectedness of phenomena that have occurred in the past, down to the present time. Because this type of analysis also deals with outcomes, future phenomena and their outcomes can be predicted.

- **Structuration Theory**

Giddens (1976, 1979, 1984) uses an analytical approach to identify the dimensions of structure and defines them as signification, domination, and legitimation. Similarly, the dimensions of action are defined as communication, power, and morality/

sanction. These are parameters, which are characteristic of seemingly different variables that are acting within the organisation. Although the various aspects of each dimension can be observed and studied as separate variables in isolation, Giddens postulates that the active principles that are contained in each dimension tend to operate in a way that modifies them. Giddens defines these media as "modalities" and provides a classification of these modalities as interpretative schemes, resources, and norms. Interpretative schemes are well-structured systems of knowledge that are common to all the participants, so that participants can interpret social interaction and events that take place in a common, understandable, and meaningful way. Resources offer a medium through which actions can be initiated to meet pre-set objectives and by which changes in objectives can take place. Through resources, power can be exercised or subtly blocked. Norms are standards of conduct that are accepted within the organisation and tend to build an ongoing pattern of accepted behaviour.

Despite the elegance of Giddens's approach in providing a manageable framework for the analysis of a social system, the scientific process requires that the data, used in a particular model, must, after analysis, produce outputs that reflect real world phenomena. In this sense, Giddens's approach can be included in the scientific process as a classification of parameters that can be used to initiate research work in a structured manner. It should be noted that Giddens provides a framework and not a complete solution to the investigation of social behaviour; nor does he provide a complete methodology that covers every aspect of analysis that is possible in the social dimension. A complete analysis of a social system must contain a series of value judgements in the collection of data relating to different interactions, their processing, analysis, and interpretation. In the area of value judgements, the principles of impartiality, objectivity, and consistency of approach towards well-supported conclusions become extremely relevant.

- **Walsham's Analytical Framework**

Having shown clearly that the study of IS needs to be set in the organisational context, Walsham (1993) discusses the concept of organisational metaphors concerning culture and politics. He shows that contingency theory approaches, of which the stages of growth models are one example, have limited value, as they cannot always be easily applied across all organisations. It is interesting to note that this conclusion has also been reached in the evolutionary economics literature, where it is recognised that the successful application of technology will vary between different business units in the same industry (Metcalfe and Boden, 1991).

It is inevitable that the introduction of IT into organisations will, by its very nature, mean that organisations must adapt and develop its new practices. Giddens's Structuration Theory takes this fully into account and applies the theory as a means of integrating the dual forces of process and context (Giddens, 1984: 25 f., 233-6). For this reason, Walsham (1993) makes use of Structuration Theory and indeed applies it as the cornerstone of his analytical framework. Walsham also draws on Pettigrew's longitudinal studies of process and context, obtaining thereby a means of analysing situations contextually, and he also takes advantage of Kling and Sacchi's work in order to demonstrate how process and context are important in the field of IS.

Walsham provides three case studies that give the reader a useful means of exploring the framework he has developed to investigate the issues of organisational change that are central to the introduction of IS and IT. While it is clear that the need for organisational change is being more clearly recognised now than ever before (Galliers, 1991a), Walsham's framework enables a wider discussion to be undertaken, which addresses the social, cultural, and political aspects, among others, of change in an organisational context.

Clearly, while IS is now generally recognised as a social science and the problems associated with the scientific tradition in research in IS are now becoming more generally debated, there is still some confusion as to the relevant paradigm for the study of the field. Hirschheim (1992, pp. 51-52) shows that the behavioural perspective on IS research may have only limited validity, being based on the scientific tradition. This is interesting considering Walsham's (1993, p. 11) comments on Checkland's Soft Systems Methodology (SSM). SSM was described by Checkland (1981) as essentially derived from the scientific tradition and could, arguably, be said to be a behavioural approach to IS research. The criticisms raised by Walsham have also been identified by SSM practitioners in Australia (Galliers *et al.* 1991), where clearly radical change is dependent upon the quality of the facilitator rather than being inherent in the approach. Walsham also provides a useful, albeit brief, discussion of the main philosophical ideas that have been used as a means to move IS research and theory into the social science arena.

2.4 Chapter Summary

This chapter has presented a discussion of IS research frameworks and IS research that are related to the proposed research project. In this chapter there are a number of IS research frameworks that suggest different ways to conduct research into IS. This proposed research project does not fall within one particular research framework. It does, however, overlap with various frameworks that suits the objectives of the proposed research project.

This chapter attempts to justify the Multiple Perspective Approach as an appropriate mode of inquiry for this study. The methodology has been derived systematically from assumptions held by the researcher concerning the nature of the research topic and the conduct of this type of research. The utility of defining these assumptions at the outset has been two-fold. First, it provides justification for the

research methodology adopted. Second, it formalises the conduct of research in a field characterised by complex social interactions.

The next chapter discusses the research methodology, adopted for this current research project.

3 Research Methodology

Chapter 2 has established the research framework for IS research in this study. This chapter presents a general discussion of the different approaches that may be appropriate to research work in the area of CBIS implementation in large organisations. Emphasis is placed upon those approaches which seem relevant to the objectives of this current research project. The objective is to examine the role of senior executives in the implementation of CBIS in government organisations, with the aim of advancing knowledge in this area that will contribute to improved ISD and practices. It will be appreciated that the decision about which approach to adopt for a specific research project should be made in the light of identified research objectives. Changing the objective or the nature of the objective will necessarily change the fundamental approach to the research work.

Firstly, a discussion of research approaches is presented. A comparison of categories of research is made. Based upon the research objectives of this current project, a combination of quantitative and qualitative approach is suggested regarding

data gathering. The initial research findings from the exploratory study, which was carried out using the survey method, are further explained through case studies.

Secondly, whilst a qualitative approach will mainly be adopted, it is also considered important to use the relevant theoretical framework for the case studies in order to keep the research work compatible with the epistemological beliefs of the researcher as explained in Section 1.7.

The discussion in this chapter provides a description of the context within which the current research project is conducted. This discussion proceeds from a presentation about a general research approach to a more specific research method. The next chapter provides the background information on Malaysian government organisations and discusses the survey model and findings of the exploratory study.

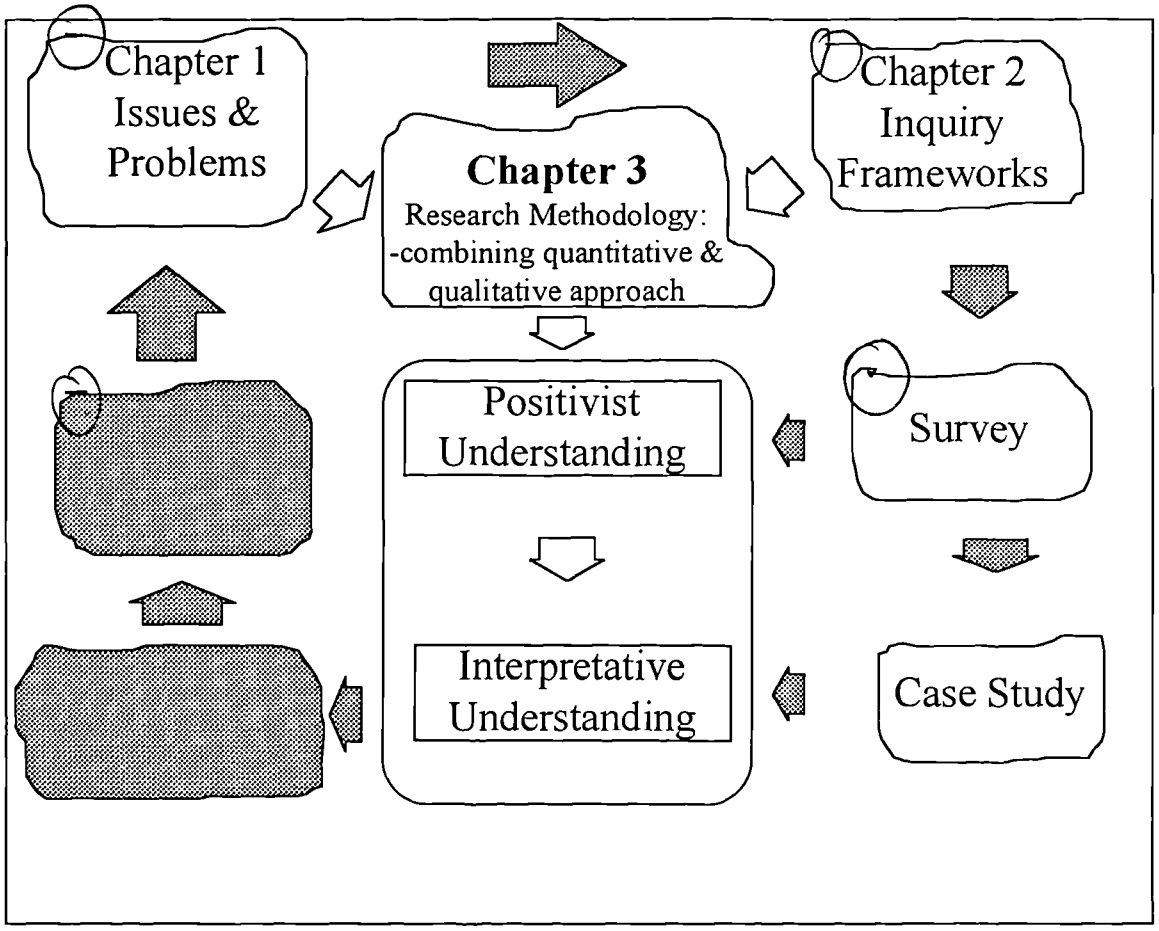

Figure 3.1: Chapter 3 Research Processes

3.1 Research Approaches

The discussion that centres around the characteristics of different approaches and the implications of their use for IS research can be found in the reports of three major conferences. These forums for exchanging ideas related to research approaches in the IS field are as follows: Harvard Business School Research Colloquium held in Cambridge, Massachusetts, 1983 (McFarlan, 1984); IFIP WG 8.2 Colloquium "Information Systems Research - A Doubtful Science?" held in Manchester, 1984 (Mumford *et al.* 1985); and IFIP WG 8.2 Working Conference "Information Research Arena of the 90's" held in Copenhagen, 1990 (Nissen *et al.* 1991).

A theme that emerged from the Manchester Colloquium and again from the Copenhagen Conference (Nissen *et al.* 1991) was that both "natural science" and "social science" approaches are complementary and not opposing alternatives, so that accepting any one type as the "best" regardless of context is unnecessarily simplistic, restrictive, and, in some cases, damaging (Morgan and Smircich, 1980; Reason and Rowan, 1981). Although the greatest benefits might be obtained through combining the extremes of a highly "scientific" (natural science) approach with an "interpretivist" (social science) one, Burell and Morgan (1979) found the approaches to be mutually exclusive because their underlying assumptions are contradictory. However, Morgan (1983) argued for a methodological pluralism in which different methods and approaches are treated as tools to be used where appropriate.

Many recent studies have also directed attention to ways of improving the quality of IS research. In a review of the relative strengths and weaknesses of thirteen different methodologies that have been applied to IS, Jenkins (1985) emphasised the importance of selecting appropriate research methodologies. Following the same

tendency, other researchers have sought to describe and evaluate specific methodologies such as action research (Antill, 1985), case studies (Benbasat *et al.* 1987), and qualitative methods (Goldstein, 1986). Research would also be of benefit if the nature of data that are collected is both qualitative and quantitative, as was shown by Kaplan and Duchon (1988).

Galliers (1991b) reviews "approaches" to IS research. He divides the 12 approaches into "scientific (empirical)" and "interpretivist" in line with the framework of Burell and Morgan (1979). Visala (1991) also provides a framework for the consideration of research approaches. The approaches considered differ somewhat from those discussed by Galliers, being more rooted in the theory.

Lee (1991) has suggested an integrated framework for the "positivist" and "interpretative" approaches[7]. By integrating two approaches into a single framework, consisting of "three levels of understanding", it fully recognises and incorporates the fundamental concepts of both the positivist and interpretative approaches (Table 3.1).

Table 3.1: An Integrated Framework for Positivist and Interpretative Approaches

Levels of Understanding	Descriptions
1st Level: Subjective Understanding (The observed human subject)	• Consists of the everyday common sense and everyday meanings with which the human subjects see themselves • Which give rise to the behaviour that they manifest in socially constructed settings
2nd Level: Interpretative Understanding (The observing researcher)	• Interpretation of the first-level, common sense understanding • The postulate of subjective interpretation, Verstehen, the hermeneutical circle, and thick description
3rd Level: Positivist Understanding (The observing researcher)	• The researcher creates and tests to explain the empirical reality that is being investigated. • The explanation consists of formal propositions that typically posit the existence of unobservable entities

[7] Walsham (1995), argued that the development of the "interpretative" empirical school of IS has not been free of controversy, and debate continues on the relative merits of interpretivist versus positivist approaches to IS (Orlikowski & Baroudi, 1991), or the possibilities for their combination (Gable, 1994; Lee, 1991).

3.2 Combining Quantitative and Qualitative Approaches[8]

Quantitative methods, which include questionnaires, have been widely used over the past 20 years in an attempt to link contextual factors with some aspects of the control variables that are relevant to the study. This approach developed from the area of management research and includes the use of questionnaire surveys. As a result, contextual factors have been identified which affect the design of management systems and include size, structure, technology, environment, and the organisational culture. Although these relationships that exist between contextual factors and management variables can be tested, the examinations of these relationships have been based solely on statistical analysis.

This has provided a level of scientific respectability, where statistical analysis can reveal the profile of the "norm" based on the distribution of the data from which a level of generalisable conclusions can be based, within the mathematically defined levels of confidence. By measuring the impact of each of the management variables on the contextual variables and providing this information within mathematically defined limits of possible error, it has been possible to reach conclusions that are generalisable and based on a rigorous methodology. Despite this, there is the question of the selection of variables for this type of analysis and the need to decide whether they are the correct variables for the purpose of a complete analysis. Because of this, the quantitative approaches have been criticised as "thin", "narrow", and for failing to provide detailed coverage and specifications of the management systems under study.

In recent years more emphasis has been placed on the relative merits of quantitative and qualitative research, taking into account the level of involvement with

[8] Pervan and Klass (1992), and Yin (1993) argued that quantitative and qualitative techniques may be utilised irrespective of the research method being employed.

respondents during questionnaire surveys, structured and unstructured interviews, and direct and participant observation. The findings reflect the view that the researcher should have a close involvement with the organisations concerned. An objection to this procedure - the influence of interviewer bias - has been noted by Benbasat *et al.* (1987), who observe that the results depend heavily on the integrative powers of the investigator.

The close involvement with the organisations concerned have produced research findings that describe rather than prescribe, and have been referred to as "thick" (Geertz, 1973), "deep" (Sieber, 1973), and "holistic" (Rist, 1977). In an attempt to counter the unsatisfactory nature of research work in IS, the qualitative method of the respondent interview could provide the opportunity to develop theories of IS that are based on an analysis of managerial practices undertaken in the real world environment. By describing these practices accurately, and by allowing participation and flexibility in the interpretation of the findings, new lines of thought could be opened up in this important area.

The conclusion drawn by the researcher in this study is that the importance of the issues should be taken into account in the analysis of IS. If the issue at stake is a relatively minor one, or cannot be approached in any other way because of the limitations of a particular time-frame or cost, then a single technique involving a high number of respondents and a low level of involvement might suffice. Where the issues concern IS practices in large organisations, providing that the avenues of research are open to the researcher, they should be pursued. This view has been accepted by such authorities as Burgess (1984) and Denzin (1978), who suggested that a combination of qualitative and quantitative techniques should be used in the analysis of social systems. Bryman (1988) observed:

> ...when quantitative and qualitative research are jointly pursued, much more complete accounts of social reality can ensue... the rather partisan

> either/or tenor of the debate about quantitative and qualitative research may appear somewhat bizarre to an outsider, for whom the obvious way forward is likely to be a fusion of the two approaches so that their respective strengths might be reaped.

An expression of these ideas has been given through the principle of triangulation, which supports the use of multiple measurements. According to Smith (1975), the terminology is based on real world measurements and the method of identifying three separate and discrete points of reference to provide a frame of reference that accurately defines the location of an object. He states the need for a minimum of three reference points in real world situations, such as surveying and navigation, but, for social science, the definitions are not so precise.

Despite this, there is a broad agreement on the general approach. A definition of "triangulation" in social research terms was given by Denzin (1978) as "the combination of methodologies in the study of the same phenomenon." Jick (1979) was more specific in his perception of triangulation as a combination of qualitative and quantitative methods. Other researchers have supported the triangulation approach and have claimed that, as a general rule, multiple methods provide the opportunity to gain greater accuracy in the results of research work within social systems (e.g. Campbell and Fiske, 1959; Webb *et al.* 1966; Smith, 1975; Bourchard, 1976 all advocate that, in general, multiple methods allow for greater accuracy of results).

3.3 Choice of Research Approach

Applying both Galliers's and Visala's taxonomies has further helped the researcher to identify the appropriate research approach and theoretical framework. Since the object of research for phase 1 (exploratory study) is description, and phase 2 of the study is about theory building, Galliers's (1991b, 1993) taxonomy was found appropriate. Visala's (1991) taxonomy was useful in identifying the appropriate

theoretical framework for phase 2 of the study, thus complementing Galliers's taxonomy[9].

Galliers's taxonomy provides a comprehensive discussion of each approach with key features, strengths, and weaknesses. He then offers a matrix framework of research approaches against "objects" of research. Focusing on three categories, the first concentrates on IT as it impacts on society, on organisations or groups, or on the individual. The second category focuses on the technology, or methodology. The final category focuses on theory building, theory testing, or theory extension. On the theoretical aspects, Visala (1991) first discusses the appropriate contexts of seven research approaches with their ontological "horizon". He then reinterprets the frameworks of Ives *et al.* (1980) with nine ontological levels or components (e.g. external environment, organisation environment, development process).

Table 3.2: Choice of Research Approaches

Adapted from Galliers (1991b, 1993) and Visala (1991)

	Galliers's Taxonomy		Visala's Taxonomy
	Phase 1	Phase 2	Phase 2
Purpose of research	Theory building Description	Theory building Methodology	Implementation process
Nature of phenomena under investigation	Society, Organisation/ group	Society, Organisation/ group	Implementation environment
Modes or framework for explaining assumptions and beliefs	Survey	Case Study Descriptive/ interpretative	Hermeneutics Teleological explanations

Table 3.2 shows two research approaches that can be identified using Galliers's taxonomy. The purpose of the survey is to explore and describe the existing theory

[9] Five research approaches are in Galliers's taxonomy: case study, survey, simulation and game/ role playing, descriptive/ interpretative, and action research.

related to the senior executive's influence in the ISD process, especially from the perspective of the senior executive leadership role. Case studies are then used, as a form of contextualist inquiry in phase 2 of the study, to further understand the significance of the senior executive's influence in CBIS implementation - a phenomenon in its context in the initial stages of the knowledge-building process. The hermeneutics methods were also used in the interpretation of the case study findings.

3.3.1 The Survey Approach

According to Pinsonneault and Kraemer (1993), survey research is most appropriate when the objectives of the research are to establish "what is taking place", and to identify "how something is happening" and "why it is happening". This is particularly valid when phenomena must be studied in their natural setting and when the control of variables influencing the phenomena is not possible, or undesirable. Survey research is also appropriate in the examination of phenomena that are currently taking place, or those which have occurred recently - events, situations, attitudes, or opinions that are occurring in a population. In this way, the results of survey research can be directed towards testing a theory or identifying and explaining causal relationships.

In a broader context, descriptive surveys may be adopted to identify the areas in which a particular problem occurs or to assess the extent and nature of other known problems. A descriptive survey will attempt to determine the distribution of some phenomena in a population or among subgroups of a parent population. The aim is to describe a distribution and the analysis of these descriptions is directed to determining "factual" perceptions that may or may not be in line with reality. Since the aim is to describe and compare distributions, the analysis resulting from descriptive surveys does not aim to provide explanations based on cause and effect, and these types of surveys are not used to test a theory.

Along with descriptive surveys, new hypotheses can be established by means of survey research in the context of exploration. A particular topic for investigation is chosen with the aim of conceiving its nature and characteristics, and, therefore, to clearly identify it by an analysis of the frequency of responses that occur in a given population, to the topic under study and its assumed characteristics. In this way, perceptions, attitudes, and modes of behaviour can be discovered within a specific population.

Theories and cause and effect relationships can be tested by survey research in explanation. Survey research can also identify causal relationships by asking questions about the actual or possible relationships between variables. Through the analysis of these relationships, definite correlations can be established between two or more variables, and it may be seen how this relationship operates in a causal manner. This can lead on to the question of why the relationship exists within the population.

Whichever type of survey research is used - description, exploration, explanation - the purpose of the survey is to provide a quantitative description of some phenomena within the population, and this requires that data be collected in a suitable form for quantitative analysis, preferably by applying structured and predefined questions and the information collected must be from a representative sample of the total population. Also, the sample must be of a sufficient size that the conclusions drawn from the survey can be applied to the population with a meaningful degree of confidence.

Despite the confidence levels that can be expected from the analysis of data from organised and structured surveys, these methods are less appropriate than other approaches when a large number of independent and interrelated variables have given rise to complex interactions over a period of time. In such instances a more judgmental

and humanistic type of analysis is required such as naturalistic observation and in-depth analysis of information collected during case studies.

3.3.2 The Case Study Approach

Benbasat *et al.* (1987) classified qualitative research in three ways that are often regarded as case study classifications:

- *Applications Descriptions*, which have been documented by researchers based on experience with their own theories, but without having completed a researched study.
- *Action Research*, where the researcher participates and therefore has the dual objectives of taking action to resolve a problem and acquiring IS knowledge.
- *Case study Research*, where the research questions are predefined by the researcher, who then becomes an observer and investigator as opposed to a participant.

The key characteristics of research work involving case studies are summarised in Table 3.3, which is also adapted from Benbasat *et al.* (1987). While it is difficult to categorise the work of Benbasat, three general classifications can be used to describe his suggested approach. These are concerned with guidelines for implementation, the processes that take place, and the result.

Table 3.3: Key Characteristics of Case Studies

Adapted from Benbasat *et al.* (1987)

IMPLEMENTATION
The phenomenon is examined in a natural setting.
Experimental controls and manipulations are excluded.
One or few entities (person, group, or organisation) are examined.
PROCESSES
The complexity of each entity is studied intensively.
Focus is on contemporary events.
Exploration, classification, and hypothesis development.
"Why" and "how" questions should reflect operational linkages.
LIMITATION
Results depend heavily on the integrative powers of the investigator.

Because of the large number of variables and interactions that are expected in the case study environment, it is not reasonable to impose experimental conditions and controlled conditions, which rely heavily on the ability to hold several variables in place, while studying the effect of a limited number of variables in a systematic way. The suggestion is that experimental controls are not attempted, and that the number of variables is further reduced by examining only one or a few entities (a person, group, or organisation). In this way, the phenomenon is allowed to exhibit itself in its natural setting.

While this form of implementation may be achievable, a commitment to unbiased process may be more difficult. This involves interpreting the evidence in an objective and non-political way, and a willingness to change if the evidence points in another direction at any time up to the process completion. The process can only be considered as complete when the evidence amassed supports the conclusion. The

result will depend partly on the level of commitment to the process and on the ability of the observer to perceive evidence in depth across a wide area and to integrate it within the process.

Further observations and suggestions have been made where the study involves more than one case. In such instances a replication, as opposed to a sampling logic, is suggested (Yin, 1989, 1993). Each case is regarded as a discrete investigation with an analysis performed across the whole. The theoretical framework, within which the case studies are set out, provides the statement of the conditions under which the findings of the case study are equivalent (literal replication) or different in some way (theoretical replication).

Because of the qualitative nature of case studies, the researcher approaches the case study with fewer preconditions than those attached to other methods of investigation. In the case of surveys, experiments, and field studies, the researcher has made some assessment of the variables involved and how they can be measured, before entering into the investigation. Also, case studies have the advantage of bringing the researcher into real world situations, rather than having to rely on reasoning based on established theory and abstract frameworks.

The major strength of this research method is its ability to capture "reality" in considerably greater detail (Galliers, 1991b, 1993). Atwell and Rule (1991) have described how case studies provide a means of describing the relations that exist in specific situations, and they have reported that their experiences of spending days observing and communicating with people in the workplace present a powerful inducement to the researcher to adjust to the views and experiences of people who are habitually involved with the technology. Fieldwork allows one to be present at pivotal events that suddenly clarify causal relationships in a way that one never would have guessed or deduced from theoretical frameworks (Atwell & Rule, 1991). At the same

time, it provides a method by which established theory can be adjusted and amended. This view has been developed by Robey, Gupta, and Rodriguez Diaz (1990), who suggest that, when other considerations are taken into account - the background, history and implementation of technology, the result can enrich the use of case studies and may produce significant new research findings.

3.3.3 Using Hermeneutics in the Interpretative[10] Approach

The emphasis of this research work is on descriptive analysis and interpretative analysis in order to make sense of observable phenomena. The process of subjective investigation and interpretative analysis is known as an hermeneutic process of inquiry, and is the approach adopted in this research work.

The origins of hermeneutics are in textual analysis of ancient documents, but the principles derived from this activity have broad applicability. The hermeneutic view takes the position that the activity of interpretation is not necessarily mysterious or esoteric but is already practised by people in everyday settings (Boland, 1984). Examples of how people in everyday situations practise interpretation on a regular or routine basis include how people read a text and how people come to understand one another in their everyday interactions.

When we read a text, we interpret the meanings intended and expressed by the author. In the same way, when we "read" another person's behaviour (either physical or verbal), we interpret meanings intended and expressed by that person. The novelty of hermeneutics resides in its framing of people, their behaviour characteristics, and the organisations they create, as "text" to be "read". Performing the "reading" are people who themselves may be involved as organisational participants.

---

[10] Lee (1991) discusses two other methods in the interpretative approach besides hermeneutics, i.e. phenomenological sociology and ethnography.

The useful application of hermeneutics to IS problems has already been noted by researchers in the IS discipline. Boland, for instance, has conducted his own research with the help of concepts from Hans Gadamer, a contemporary authority on hermeneutics: "The world must be interpreted by us in order for our intentional action to be possible. This is a universal hermeneutic problem, fundamental to our everyday life" (Boland, 1984, p. 195). Winograd and Flores (1986) echo this theme in their book *Understanding Computers and Cognition: A New Foundation for Design:* "Just as we can ask how interpretation plays a part in a person's interaction with a text, we can examine its role in our understanding of the world as a whole" (p. 30).

Kuhn provides the following descriptions of how a hermeneutical analysis proceeds (cited in Bernstein, 1983, p. 132):

> When reading the works of an important thinker, look first for the apparent absurdities in the text and ask yourself how a sensible person could have written them. When you find an answer...when those passages make sense, then you may find that more central passages, ones you previously thought you understood, have changed their meaning.

In a sense, the basic principle in a hermeneutical interpretation of human behaviour in a situation such as an IS implementation process is that people think they know what they are doing, that is, people behave in ways they think are rational responses to the circumstances of their situation (Kanter, 1977).

3.4 Research Design

This section discusses the design of the research programme in line with the research objectives. Research design can be thought of as a road map for the researcher as it is the means by which investigators plan the collection of data to answer a pertinent research question. In general, research design provides the "plan

and structure enabling the researcher to answer relevant research questions as validly, objectively, accurately and economically as possible" (Abdel-Khalik and Ajinka, 1979). As some aspects of the research design are discussed in the forthcoming chapters, this section explains the steps involved in developing the framework and the data collection procedures.

Basically the exploratory study of this research follows the deductive method[11] in social science by building up from previous studies. Various models of stakeholders' participation in the CBIS development process have been introduced. This study fills a recognised gap in these models by introducing additional dimensions of executive support through their leadership role. On the basis of the existing theories, a conceptual framework is developed by synthesising the relevant concepts. Propositions are then formulated to operationalise the framework with major variables, using data collected through the questionnaire and interviews, and conclusions are drawn for further investigation.

Further, this study also adopts a triangulation approach by mixing both the quantitative (questionnaire survey) and the qualitative (case studies through respondent interviews and secondary data analysis) methods. Moreover, the researcher strongly believes that different research methods should be regarded as complementary rather than mutually exclusive. The triangulation approach provides two important opportunities to a researcher. First, it allows a researcher to be more confident of his result. In the current study, for example, the organisational/managerial variables underlying the propositions were not arbitrarily selected. They were confirmed from the generalised findings of the questionnaire survey, giving confidence that the variables chosen represented critical dimensions for CBIS implementation in public

[11] Hempel (1965) described deduction as a form of inference that derives its conclusions by reasoning through premises, which serve as its proof. A deductive approach follows the process of deduction.

sector agencies in Malaysia. Second, this approach enables the researcher to integrate the quantitative findings with the interview observations. By examining and adapting existing investigatory frameworks, the significance of executives' participation, involvement, commitment, and leadership roles could be tested using the quantitative data gathered through the questionnaire survey and the qualitative observations from the interviews. It involves data source triangulation as described by Hammersley and Atkinson (1983):

> Data source triangulation involves the comparison of data relating to the same phenomenon but deriving from different phases of the fieldwork, different points in the temporal cycles occurring in the setting...the accounts of different participants involved in the setting.

The adoption of data source triangulation reduces the likelihood of serious distortion in the research findings.

Initially an exploratory study was undertaken to guide further subjective investigations and interpretative analyses. The exploratory study included collecting research data from the responses to questionnaire surveys and participative interviewing. The objective of the exploratory study was to determine evidential links between the approaches adopted by senior executives towards CBIS implementations and the levels of success achieved in those implementations.

The second part of the research work makes use of the research strategies based on the application of appropriate theoretical frameworks that contained sufficient scope to allow in-depth subjective investigation and interpretation of complex multilevel hierarchies involved in large-scale computerisation projects. The design of the research program is summarised in Table 3.4, and was used to establish the detailed steps that needed to be undertaken, assumptions that needed to be made, time scales for the research program and other practical steps that needed to be taken to pursue and achieve the objectives of the research activities.

Table 3.4: Design of the Research Program

Profile	Exploratory Study	Case Study
Concepts studied	• senior executives' support (participation & Involvement) • leadership role	• government administrative machinery and policies on computerisation project
Relationships examined	• to determine relationships between senior executives' support, leadership role, CBIS use and success	• to gain views and opinions of the CBIS project stakeholders including head of organisations, IS practitioners, managers and users
Fieldwork	• mailed questionnaire • interviews	• secondary data analysis • interviews
Respondents	• IT/ IS managers in 68 government agencies	• forty-six senior executives, IS managers, systems analysts and user in various government agencies including PSD, MAMPU, MLCD & ID
Data Analysis	• statistical analysis: frequency, factor analysis and crosstabulation	• multiple perspectives analysis: Multilevel analysis and Multiview methodology

3.4.1 Phase 1: The Exploratory Study

- **Concepts to be Studied**

The executive's support (participation and involvement) and leadership role form the concept to be studied in this exploratory study, which emanates from the statement of the research problem. The CBIS implementation is examined using the IS research framework developed by Ives *et al.* (1980), and Ein-Dor and Segev (1981). Conceptually, the research emphasises that the levels of support by senior executives in the ISD process are determined by their leadership roles in the organisations.

- **Relationships to be Examined**

The relationship between the executive support/ leadership roles and key organisational/managerial factors is examined through crosstabulation. The relationships established through these analyses are complemented by the findings from the qualitative analysis of the interview data and the theoretical framework of the case studies' analysis.

- **The Fieldwork**

The primary data was collected in Malaysia during two months of fieldwork in 1994 and another month of fieldwork in 1995. Fieldwork in Malaysia was necessary so that the nature and locality of the problem could be analysed in context. It involved the administration of mailed questionnaires and the conducting of interviews with the identified respondents. Detailed discussions on the design and the testing of the questionnaire and the interview schedules, as well as activities involved in the fieldwork, are presented in Chapter Four.

- **Selection of Respondents**

The questionnaire survey is designed firstly, to elicit information from the IT/IS managers or their deputies in Malaysian public sector agencies. Since all the IT/IS managers with data processing functions in their organisations are included in this survey, it is in fact more akin to a census survey[12].

[12] A census is an enumeration of the characteristics of some population (Babbie, 1989). A census is often similar to a survey, with the difference that the census collects data from all members of the population and the survey is limited to a sample.

The selection of the IT/IS managers is based on the fact that they are the CBIS implementers in their respective organisations. They are also the secretariat to the computer steering committee of their respective agencies, which is an important instrument for integrating all aspects of an organisation's IS implementation. However, the chief executive is entrusted with the responsibility to guide in planning, utilising, and managing the IS resources in pursuance of the organisation's objectives.

For the interview sample, the purposive sampling method is employed. It is a type of non-probability sample in which we select the units to be observed on the basis of our own judgement about which ones will be the most useful or representative. Another name for this approach is "purposive sample" (Babbie, 1989). The judgement on whom to interview is arrived at using multiple criteria so that representation is possible across a number of facets of the public sector, labelled economic, social, or administrative.

Second, is the type of organisation, covering the Federal Ministries, Federal Departments, Federal Statutory Bodies, State Administrations, State Departments, Municipalities, and Central Agencies. This criterion follows the strata (stratified samples) of the administrative levels so that the study variable ranges less within each stratum than between the strata.

The final criterion is the level of respondents in their respective organisations. For *in-depth interviews* the chief executives or their deputies, divisional heads including personnel and finance heads, and operational /functional heads are involved. In some cases the interviews were conducted with the chief executives or deputies and the IS managers. In *shallow interviews* the chief executive or deputies or IS managers are interviewed, depending on the circumstances prevailing at the time.

- **Data Analysis**

The primary data collected during the fieldwork have been analysed in two stages. First, the statistical analyses were performed using the computer software SPSS for WINDOWS. Descriptive statistics, such as measures of central tendency (mean, median, mode) and measures of dispersion (standard deviation, variance), were used to describe the data, where appropriate. Data reduction and clustering were performed through factor analysis. Crosstabulation was carried out to establish relation between the variables.

The aim was to establish the pattern of relationships between the executive support and leadership roles. The results of the analyses may be generalised in view of the comprehensive coverage of the survey. The qualitative analysis of the interview observations was aimed at complementing the quantitative findings with the focus on similarities and differences. The method, more akin to the case study approach, involves two-tier interviews to highlight key contrasts. A few agencies were selected for detailed study while shallow interviews were conducted on the others. By combining the methods of data collection and analysis the researcher is fully confident about the accuracy of the findings, representativeness of the samples and relevance to the research problem.

3.4.2 Phase 2: The Case Studies

In phase 2 of the study, the qualitative analysis of the secondary data and interview data were undertaken through case studies. The examinations of secondary data are mainly of matters related to the Malaysian government's administrative machinery and policies on computerisation projects, which were handled by the central agencies known as the Public Service Department (PSD) and Malaysian Management Modernisation Unit (MAMPU). The interview records (written notes and recorded

audio cassettes) gathered from the agencies known as operating agencies that implement the policies were examined and observations were analysed using the appropriate theoretical framework. The discovery of additional factors that are relevant in describing the significance of executive support and leadership roles is the main contribution of this analysis. Finally, the conclusions about the relationships were drawn on the basis of the findings from the quantitative and qualitative analyses.

- **Selection of Respondents**

Some of the interviews were carried out simultaneously during the questionnaire survey. Forty-six government officials were interviewed. The interviews revealed some interesting themes in the research. These themes were developed through consideration of the views and opinions regarding CBIS projects of the following stakeholders: the Head of Organisations, the IS professionals, and the user/ functional managers.

Each of these views were explored through case studies. Several CBIS projects in government Operating Agencies were identified during the survey and interview exercises. Initially, CBIS projects with the following criteria were the basis for the case study settings:

- CBIS projects that have continued for more than three years. This is to ensure the project has undergone the approved basic project life-cycle required by the government's guidelines on computerisation projects;

- CBIS projects having had more than one Head of Organisation during the project's life span, so that the different leadership roles can be identified; and

- CBIS projects that have been implemented and used by the user, at least in the first phase. This is to ensure that users can give their considered views on the benefits or drawbacks of the projects.

Using these three criteria, the following CBIS projects are considered: 1) the National Land Information Systems, in the Ministry of Land and Co-operative Development, and 2) the Immigration Department.

- **Data Analysis**

Within Walsham's (1993) Multilevel framework, context-process-linkage analysis (Table 1.1) was used as a case study protocol to guide the data analysis. Where appropriate Multiview methodology was used to complement the analysis. The source data were compiled from direct or participant observation, interviews, archival records, and physical artefacts. The use of primary and secondary sources enables initially divergent lines of investigation to be followed. With appropriate propositions, and the techniques involved in inductive and deductive reasoning, the process of convergence can be pursued to reach the final conclusions.

3.5 Limitations of the Chosen Research Approaches

The aim of the research was to generate information that contributes to an understanding of socio-technical issues involved in the area of technology implementations in large multilevel hierarchies that are characterised by conflict, dissatisfaction, and the inappropriate use of political power. Information collected from survey questionnaires, participative interviewing, and through the observation of real-world phenomena in such environments needs to be qualified if it is used to provide a meaningful interpretation and valid contributions in terms of prescriptive recommendations.

Research data and the interpretations and conclusions drawn from the data can only be considered to have absolute truth if the research contributions have reliable generic application in terms of explaining observable phenomena. A critical aspect of such contributions is the use of research results to predict outcomes, and explain the cause and effect of each factor that contributes to the predicted outcome. The usefulness of such a scientific rationale in sociological research can be considered doubtful because of the vast number of factors involved that may, in some way, affect the outcome.

The use of mailed questionnaires in the exploratory study in this research work highlights the limitations of such methods used in collecting research data. The respondent may misinterpret the questions, inadvertently reply out of context, or deliberately respond with incorrect answers. In such situations the design of the questionnaire becomes a critical issue, and a complex one. Questions need to be framed in line with scientific methods and take account of mutually exclusive responses. The aim is to provide the opportunity for freedom of expression, and minimise bias. The same is true of the responses collected during participative interviewing.

Overall, the aim is to establish unique and meaningful responses that are relevant and related to the objectives of the enquiry. In such situations, the data collected can be analysed for meaning by statistical analysis. Statistical analysis can be further developed to determine correlations between factors that might not have been generally recognised.

The approach used in this research work was to use survey questionnaires and participative interviewing to establish associative relationships between the factors that were considered relevant to the objectives of the research. It is doubtful that exact

correlations that demonstrate cause and effect can ever be established in complex sociological research work, but this does not invalidate associative factors that are capable of meaningful interpretation and embody psychological truth.

A further approach was used in this research work to examine the meanings generated from the analyses of the survey questionnaire and participative interviews through case study research analysis. Objections have been raised to the case study method and its value in producing meaningful results that have a generic application and accuracy in predicting outcomes. The objection is that the case study method is necessarily narrow, and it has been noted by Lee (1989) that generalisations cannot be made when only a minimal contribution is made to the body of knowledge. Although case study analysis is by nature subjective and descriptive, Craigh Smith (1988) argues that the case study method can be developed using logical inference and that themes can be extracted so that concepts can be identified that may have generic relevance and application.

Case study analysis reflect the skills and dedication of the analyst, and various commentators have appealed for professionalism in case study research (Benbasat, 1987; Craigh Smith, 1988). Because even the most rigorous and dedicated analyst is unlikely to be completely free from preconditioning, there is always the risk of a "built in" bias in the application of the case study method. Brittain White (1985) has stressed the need for the analyst to develop self-perception, on the basis that an understanding of one's own perception will enhance the accuracy with which the analyst can study the behaviour of others.

3.6 Chapter Summary

The researcher has opted for a combined methodology for this study, utilising quantitative and qualitative approaches. Survey questionnaires and case studies are the main data collection methods. Surveys are a useful means of obtaining snapshots of practices and situations at any time, but usually provide little insight into the causes of phenomena observed in such a study, or any information concerning the processes behind the observed phenomena. Case studies have the advantage of capturing reality in greater detail and provide information on a greater number of variables and more information on the processes behind them.

Therefore, for this study, the researcher has considered the qualitative (case study) to be the major data collection method besides the quantitative (questionnaire survey). The research design has two interrelated phases, comprising the exploratory study (questionnaire survey) and the case study.

The following chapter present the quantitative analyses of the survey data. Here the researcher enquires into the existing practice of stakeholder participation and involvement in the IS implementation process. It is conducted through the questionnaires survey approach.

4 The Exploratory Study

Chapter 2 and 3 established the theoretical basis for this study. The characteristics of research frameworks and research methodology were examined in relation to the research objectives, and appropriate choices made in research designs for use in this study. This chapter is concerned with the quantitative findings of studies on Malaysian government organisations, which are discussed and analysed in view of the stipulated aims and objectives of this study. The main purpose of these quantitative studies was to derive findings concerning the nature of the influence exerted by senior executives responsible for ISD in government organisations through their own leadership role, and their support for (involvement and participation) and relationships with the IS practitioners. The findings from this study are then to be used to support findings from qualitative studies (case studies), which are discussed in the following chapter.

The model used in the questionnaire survey were adopted from two IS research frameworks discussed in Chapter 2. The questionnaire survey in Phase One

(exploratory study) helped to fulfil the first objective of the study: to understand the senior executives' influence on and their relationship to the IS implementation process.

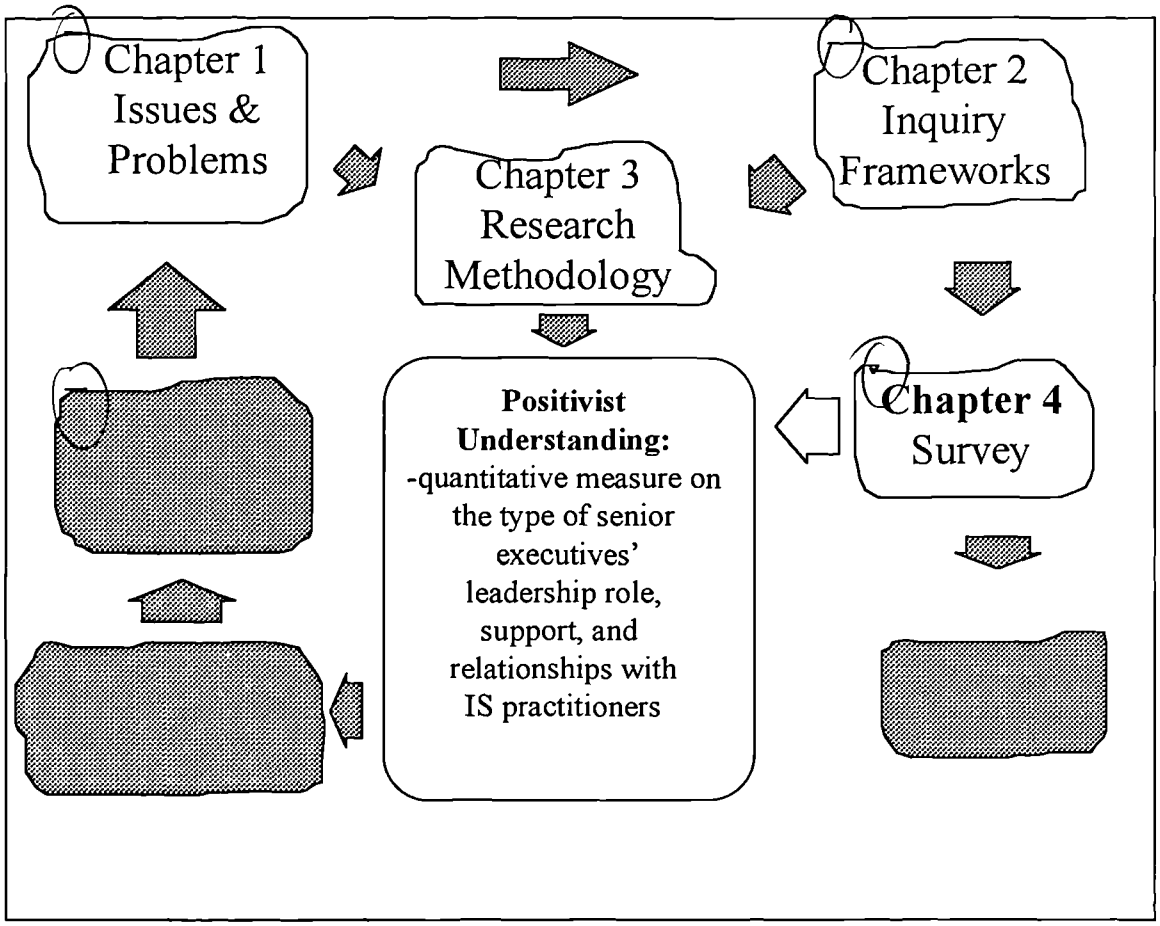

Figure 4.1: Chapter 4 Research Processes

4.1 Statistical Procedures Used

Statistical procedures involve measurements, which need to meet certain criteria before being used in the appropriate arithmetical operation. Because all numbers describe or measure something (a variable), it follows that numbers can achieve a certain level of measurement, which varies from a basic or vague description to a precise definition and measurement. Reid (1987) has stated that there are three levels of measurements or scales, which are commonly identified, viz: the nominal scale, the ordinal scale and the interval scale, and any variable can be defined according

to its place on these scales. These levels are important in helping to determine which statistical procedures can be used with which variables, since many techniques are not universally applicable but depend, precisely, on the nature of the variables (p. 36). To this can be added the ratio scale.

Within the nominal scale, numbers are simply used to classify something. For example, numbers may be allocated to user groups for reference and, while it is useful to refer to Group 1, Group 2, etc., there is a state of equivalence as no other weight is given to this nominal classification. The ordinal scale involves ordering or ranking the variables under consideration. Whereas the nominal scale has the property of equivalence (=), the property of the ordinal scale involves the scheme of greater than (>) and less than (<), as in, for example, social class grading I, II, III, etc. The interval scale involves numbers that are not only ordered, but can be ranked at regular intervals along some predetermined scale. A temperature scale may be calibrated by centigrade or Fahrenheit. Interval scales are the first level of measurement in which some arithmetical operations are allowed. Ratio scales have the same properties as interval scales, but have the additional property of having equal ratios of stated intervals, even across different scales. Such scales allow for in-depth arithmetical operations. This study has used the ordinal and interval scales as the level of measurement.

The researcher therefore decided that FREQUENCY, MEAN, FACTOR analysis and CROSSTABULATION procedures would be appropriate for data analyses in this study. For nominal scale variables, only FREQUENCY procedures were used. An overview of the statistical analysis process are in Appendix 4.1.

4.1.1 Frequency Tabulation

It is in the nature of things that characteristics can be found to progress or regress to the average over a period of time. Calculating the MEAN of a sample is,

therefore, a useful starting-point in examining the dispersion of data. Usually, frequency tabulation is the first step undertaken in any quantitative analysis (Lewis, 1984; Bryman, 1990). Where the frequency tabulation shows an approximately balanced dispersion about the MEAN, this may suggest the integrity of the sample is good. This can then be examined by statistical analysis and interpretation to form conclusions, and the levels of confidence associated with the conclusions. This type of normal distribution is the most commonly found distribution from examining frequency tabulations.

Other types of distribution may be found, which are distributed around some point other than the MEAN. In this case, the most commonly occurring frequencies (modes) are skewed away from the average of the sample. These types of distribution may or may not have validity, and should be reviewed immediately to establish a likely cause. The data needs to be carefully examined to check whether it has been collected and coded correctly. This procedure needs to be followed where the frequency tabulation shows a "flattening" around the MEAN (similar values to the MEAN are clustered around the MEAN in the frequency table). These profile characteristics (kurtoses) can indicate an equivalence of data and therefore need to be explained.

Distributions which exhibit skewness or kurtosis can result from sampling errors, because of narrow, biased data that will not reproduce the naturally occurring phenomena of the normal distribution. By examining a range of frequency tabulations, a pattern of skewness or kurtosis may emerge, which can suggest some validity or invalidity in the data, or enable limits to be set for these characteristics. Statistical techniques have been developed to compare the skewness of the two distributions and measure an excess of kurtosis (Goodman, 1968, p. 209).

In this way, errors can be minimised, spurious data eliminated, and the researcher can gain useful insights into the patterns that are beginning to emerge and

correctly identify the statistical techniques that are to be used. Otherwise, the results could be meaningless and before continuing with other types of statistical analyses, the necessary corrections need to be made at the early stage (Jolliffe, 1986, p. 182).

4.1.2 Central Tendency: the MEAN.

Frequency tabulations provide useful information clearly, and show the type of distribution produced by dependent and independent variables. Calculating MEAN also provides an indication of how the average of independent variables is related to the average of dependent variables. Where sampling occurs within different groups to examine the effect of independent variables (e.g. in this study, Q2 - type of organisation) on dependent variables (e.g. in this study, Q6 - respondent tenure), different MEAN will result for the dependent variables. The difference between these MEAN can be tested for significance by manual calculation, without the need to resort to complex arithmetical manipulations.

If the MEAN of the dependent variables converge, the indication is that there is some association between the independent and dependent variables. Reid (1987) stated that the MEAN is appropriate for interval variables and is simple to calculate and easily understood. According to Jolliffe (1986, p. 183), MEAN are the most common measure of the central tendency of variable measurements on the interval scale. The associations identified between independent and dependent variables cannot be considered causal because the data is collected from a survey and not in an experiment.

Even so, calculating MEAN uses minimal mathematical manipulations and suggests that the relationship between variables can be studied clearly, and that this method is suited to understanding information that leads to descriptive discussion.

4.1.3 Factor Analysis

Factor analysis refers to various statistical techniques whose common objective is to represent a set of variables by a smaller number of assumed variables (Kim and Mueller, 1986; Bryman and Cramer, 1990). Factor analysis also attempts to identify the factors that are affecting or playing a part in influencing a particular phenomenon. Although certain factors can be expected to influence some phenomena (result), it is the purpose of "analysis of variance" to find which of the factors, or combinations of factors, have an appreciable effect on the result. The analysis is also used to estimate the contribution each factor makes to the overall variability of the result. Often, there will be slight differences in the result, which may be because of unknown or unidentified causes or sampling errors. These differences are known as residual variations and can be assumed to be normally distributed.

4.1.4 Crosstabulation

According to Jolliffe (1986), a crosstabulation is a joint frequency distribution of cases according to two or more classificatory variables. The display of the distributions of cases, by their position on two or more variables, forms the chief component of contingency table analysis. It is indeed the most commonly used analytic method in the social sciences (p. 218). These joint frequency distributions can be statistically analysed by certain tests of significance, such as the Chi-square statistic, to determine whether the variables are statistically independent.

Crosstabulation can be applied to variables, when these variables can be classified in two or more different ways. The objective is to examine these classifications and establish whether they are independent of each other. In this way, a univariate frequency table can be broken down into two sub-tabulations, each representing a characteristic of the same variable. Because these characteristics may

not exist in all the variables, there are four possible sub-groupings of characteristics. For example, the objective may be to determine whether the deficiency in a certain quality of sampled items is a factor contributory to developing a certain situation. This would give the following four sub-groupings: items that were deficient and contributory to the situation; those that are not deficient but not contributory to the situation; and those that are not deficient but still, in some way, contributory to the situation; and those that are not deficient and not contributory to the situation.

If the divergence between observation and expectation is greater than is probable (to some specified degree of probability) as a result of random sampling fluctuations alone, the conclusion is that there is a correlation between the deficiency and the situation. Basically, this procedure was particularly useful in exploring two important areas: first, to test whether a given observation reflected the true effects (actual pattern) in the population or had actually occurred by chance; and, second, to explore the potential associations between CBIS performance, senior executives' influence, and IS practitioners' commitment.

Jolliffe (1986) has also stated that the main statistical test used to fulfil the two tasks referred to above was Pearson's Chi-square. From the Chi-square statistic, the researcher can tentatively identify the variables, and decide whether a certain characteristic of those variables occurs by chance or represents the actual traits and patterns within Malaysian government organisations. Among the variables is MIS success, progressive use of IT/ IS for CBIS performance, the executive involvement, participation, the executive leadership role for the executives' subordinate groups, and executive relationships and job satisfaction for the IS practitioners' commitment groups. If the related "significant values" of the Chi-square statistic were "significant enough", one could conclude that the observations did not occur by chance. Instead, they reflect the likely patterns within government organisations. Additionally, one could also conclude that there are potential associations between the variables being

cross-tabulated. Usually, a common criterion for deciding whether a variable has a significant value is the application of the 1 in 20 rule or .05 limit, which indicates that he is 95% confident that such observation is significant. Any value higher than .05 would be rejected. However, in this study, the researcher also looked at those variables having significant values less than 0.1, which represents a 90% confidence level (Frude, 1987).

There are many statistical techniques for measuring correlation between variables and for determining the level of significance that can be applied to this correlation, but the principle of modelling against phenomena remains the same. According to Stuart and Ord, (1994, p. 2): "Statistics is a branch of scientific method that deals with the data obtained by counting or measuring the properties of populations of natural phenomena. In this definition "natural phenomena" includes all the happenings of the external world, whether human or not". Once a standard distribution has been established, variables expressed in the form of frequency tables can be modelled against it. This can be repeated with other variables so that a measure of association can be calculated between the variables involved. The values of these variables may increase or decrease together when compared to the ideal distribution. The many statistical methods include elements of probability theory, calculus, logic, matrix analysis, and other mathematical methods - much of this used in establishing confidence levels. Crosstabulation make use of techniques that measure the relation between characteristics of different variables, which involve characteristics for which there is no objective standard of measurement.

4.2 The Exploratory Study

This section is concerned with the quantitative findings of studies in Malaysian government organisations, which were discussed and analysed according to the

stipulated aims and objectives of this study. The main purpose of these quantitative studies was to derive findings on the nature of government organisations' senior executives' influence in the ISD process on their leadership role, support (involvement and participation), and relationships with the IS practitioners. The findings from this study would then be used to support findings from qualitative studies (case studies), which are discussed in the following chapter.

4.2.1 The Exploratory Study Conceptual Framework

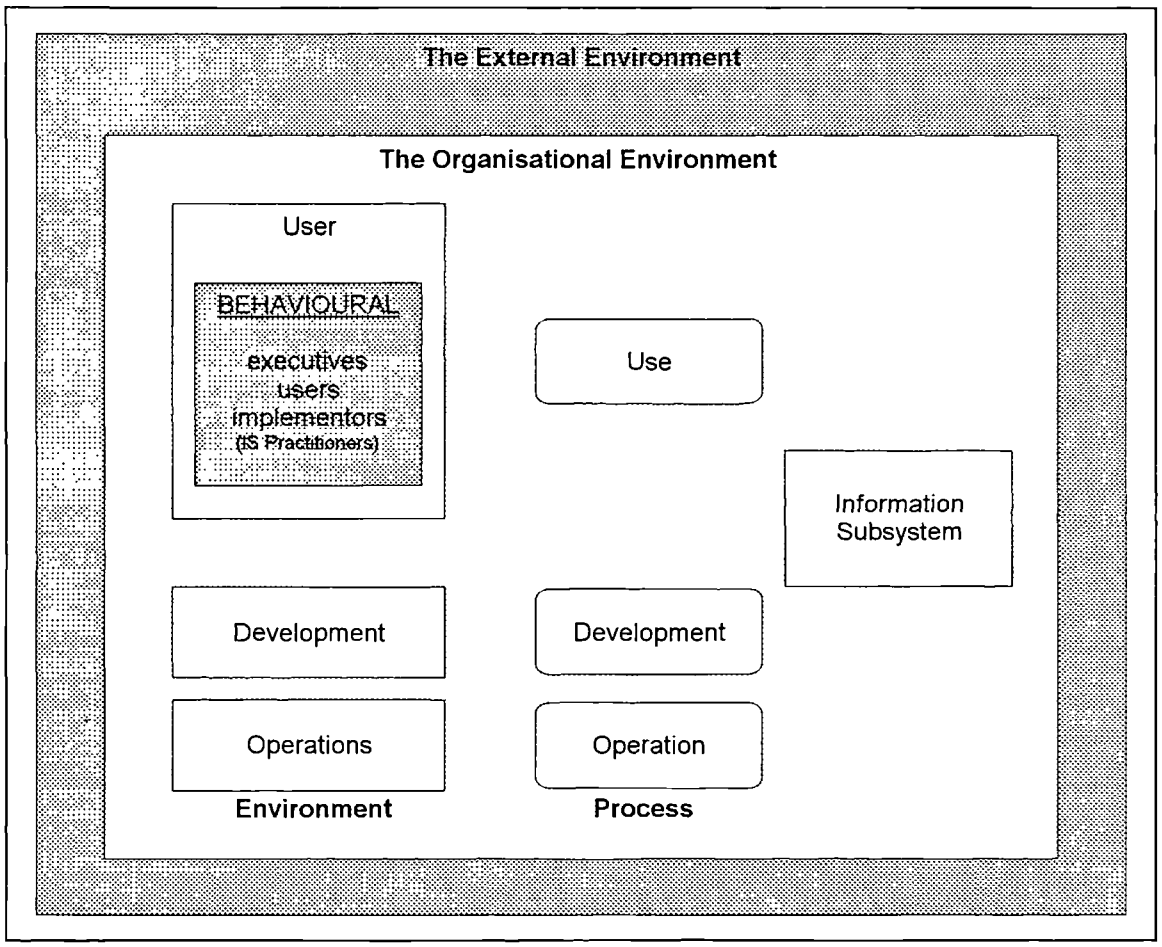

Figure 4.2: The Exploratory Study Conceptual Framework (adapted from Ives *et al.* & Ein-Dor and Segev)

Observational, historical, and survey data were used together during the problem definition phase or in the preliminary stage of the research (Figure 4.2). These data were then used to identify which leadership roles were the most influential among

senior executives in government organisations. Their CBIS performance was also examined to see whether any significant relationship existed and whether any lessons could be learned from it.

From the seven groups of variables in the survey questionnaire, three models were further developed. These models are the executives' influence, CBIS performance and IS practitioners' commitment, as shown in Figure 4.3. These models were then analysed, using crosstabulatory statistical analysis, to determine any significant relationship among the models.

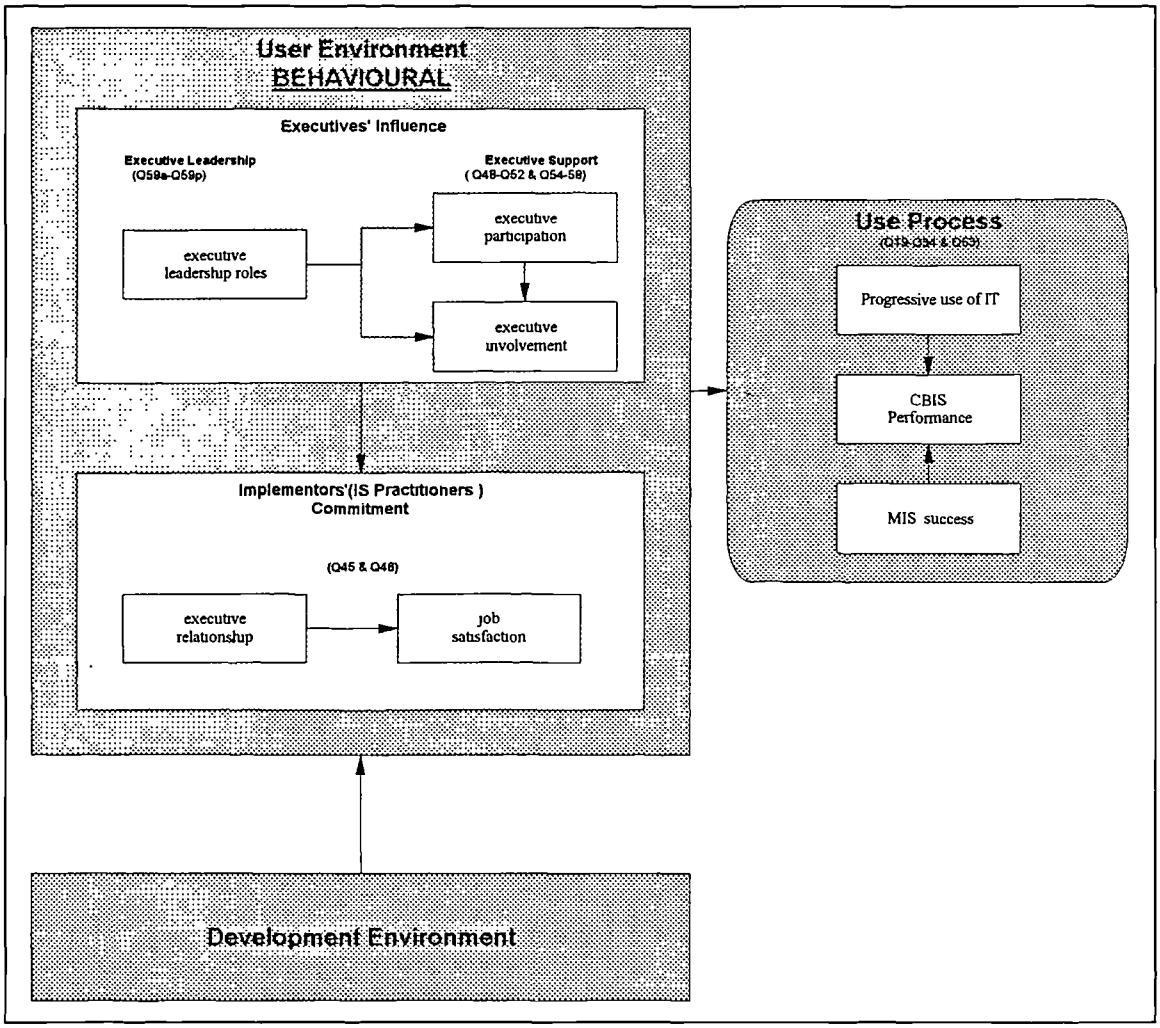

Figure 4.3: The Conceptual Model of Senior Executives' Influence in the CBIS Implementation Process

4.2.1.1 Senior Executives' Influence

A theoretical framework for senior executives' influence in government organisations has been developed using two models: first, the model developed by Jarvenpaa and Ives[13] (1991) on executive support; and, second, the model of executive leadership roles which was also applied in this study (Hart and Quinn,1993)[13].

- **Executive Leadership Roles**

This integrative model of executive leadership explains the four fundamental roles for top managers. It is based on Hart and Quinn's "Competing Values Framework" (see Figure 2.5). This framework has been validated and used to study managerial leadership (Quinn, 1988) and overall organisational effectiveness (Quinn and Rohrbaugh, 1983).

- **Executive Support**

The Jarvenpaa and Ives (1991) models of executive support were used to operationalise the concepts. Their questionnaire was used to measure the senior executives' participation and involvement in the CBIS project. The concepts of participation and involvement are distinguished using Barki and Hartwick's work (1989),as further elaborated by Jarvenpaa and Ives.

According to Jarvenpaa and Ives, "executive participation" refers to personal interventions by senior executives in the mechanics of managing IT. It is concerned with senior executives' activities and habitual behaviours towards IS planning, development, and implementation. The senior executives spend notable amounts of

[13] Permission was granted by the authors to use their questionnaires in this exploratory study (see Appendix 4.2).

their time and energy in carrying out such functions as chairing a steering committee, asking for and scanning progress reports, or approving new CBIS projects. However, senior executives' involvement is concerned with their psychological state, reflecting a perceived priority and sense of importance placed on the IT functions within the organisation. Involvement does not imply nor require senior executives' spending their personal time and energy in managing IT. It only reflects the degree to which senior executives view IT as a critical component in the success of the organisation.

Related Propositions from Ein-Dor & Segev's Framework (extracted from Table 2.3):

High levels of top management association with MIS increase the likelihood of success

The level of involvement of top managers is dependent on their appreciation, understanding, motivation, and perceptions of MIS

The level of association of top management with MIS is related to the amount of time devoted and to the number of functions performed

4.2.1.2 IS Practitioners' Commitment

The study also explores the IS practitioners' commitment in terms of their relationships with senior executives and their overall level of job satisfaction. Feeny *et al.* (1992) argue that better IS manager relationships with senior executives will contribute to success in IS planning, business or IS partnerships, and senior executives' involvement in IT management. Cash *et al.* (1988) also argued that a partnership is necessary between IS and business, while Henderson (1990) proposes a partnership model, including an organisational partnership, effective partnerships in personal relationships, mutual respect, and cohesive attitudes. Direct relationships between the senior executives and IS managers have also been studied by Lederer and Mendelow (1987), and Watson (1990). Earl (1990) has also emphasised teamwork between business and IS representatives.

Varied explanations of commitment are possible as it is a complex product of multiple causes. Reasons, such as business context variables, individual background, values or cognitive styles, professional skills and contributions, and abilities to contribute, make it difficult to extract meaningful data. However, this study defines the IS practitioners' job satisfaction and the working relationship with their senior executives as the measures of commitment. Commitment itself is defined as a "pledging or binding of the individual to behavioural acts," following the Kiesler (1971; p. 30) definition.

Related Propositions from Ein-Dor & Segev's Framework (extracted from Table 2.3):

High levels of manager-MIS association promote mutually favourable perceptions between IS staff and users, and commonly favourable perceptions of IS

The better the communications between top management and MIS staff, the greater the likelihood of MIS project success

4.2.1.3 CBIS Performance

The Doll (1985) and Jarvenpaa and Ives (1991) instruments for measuring MIS success in development and in the progressive use of IT/IS were used to assess CBIS performance quantitatively. In this research only questionnaires on project success, software adaptability, and project implementation schedules, and overall cost from Doll (1985) were used. The questions relating to data-base activities were excluded.

Since the focus of the study is to examine the dependency of CBIS performance variables against the executives' influence variables and IS practitioners' commitment variables, the crosstabulation analyses were performed at the final stage of the statistical analysis.

4.3 Malaysian Government Organisations Survey Data

The survey questionnaire consists of groupings of independent and dependent parameters, corresponding to the operational functions of IS within Malaysian government organisations, as shown in Appendix 4.3. The inquiries used in this study were divided into 7 groups of variables as follows:

1) IS Establishment Variables (Q1-14)
2) IS Development Process Variables (Q15-18)
3) IS Project Management Variables (Q19-34)
4) IS Project Maintenance Cost Variables (Q35-39)
5) IS Practitioners' Perception Variables (Q40-47)
6) Senior Executives' Support Variables (Q48-58)
7) Senior Executives' Leadership Roles Variables (Q59a-p,Q60).

However, only ordinal and interval scale data were further analysed through statistical analysis. The nominal data, being descriptive and non-quantitative, was used to supplement the results of the statistical findings of the survey.

4.3.1 Statistical Analyses of the Survey

In the first stage of the statistical analysis, all data were subjected to Reliability and Validity checks. In the second stage of the analysis, a few categories of the data were subjected to FREQUENCY, MEAN and FACTOR analysis. At the third stage, CROSSTABULATION analyses were carried out, on the basis of new groups of variables that had emerged from the factors analyses.

4.3.1.1 Reliability

The "internal consistency" of a set of measured items refers to the degree to which items in the set are homogeneous. Internal consistency can be estimated using a reliability coefficient such as Cronbach's alpha (Cronbach, 1951; Nunnally, 1967; Sellitz *et al.* 1976). Cronbach's alpha is calculated using a scale based on a given set of items. It can also be calculated for any subset of the items. It is, therefore, possible to identify the subset that has the highest reliability coefficient. The scale built from that subset is likely to best reflect the internal consistency of the data. Typically, reliability coefficients of 0.7 or more are considered acceptable (Cronbach, 1951; Nunnally, 1967; Scott, 1981).

Table 4.1: Internal Consistency Result

Grouped Variables	Original Item Numbers	Number of Items	Items Deleted (by number)	Alpha
IS Project Management	19-34	16	-	.8659
IS Practitioners' Commitment	45a-p	16	-	.8460
	46a-r	16	-	.7976
	47a-e	5	47a-e	.2713
Executive Support	48-58	11	-	.8414
Executive Leadership	59a-p	16	-	.8664

4.3.1.2. Validity

The validity of a measure refers to the extent to which it measures what is intended to be measured. Two types of validity are considered: (1) content validity, and (2) constructs validity.

A measure has content validity if there is general agreement among the subjects and researchers that the instrument has measured features that cover all aspects of the variable being measured. Thus, content validity depends on how well the researchers create measurements to cover the content domain of the variable being measured (Nunnally, 1967). Evaluating content validity is basically a question of judgement, that is, judging each scale for its presumed relevance. The instruments used in this study were devised by Doll, Jarvenpaa and Ives, and Hart and Quinn. The rigorous manner in which these authors developed and tested both complete and partial scales, plus the results achieved in their analyses lend credence to the claim of content validity. Scales that were eliminated in this study were removed for the reasons of non-relevance to the context and/or inappropriateness to the measure.

Although the descriptive analyses of the data provide some interesting information, it is not possible to demonstrate any significant or meaningful correlation between the variables, which include the executives' influence, IS practitioners' commitment, and CBIS performance. Inferential statistical techniques should allow for quantifiable relationships (causal or associational) between the variables to be established. Construct validity is an attempt to understand what property or properties can account for the variance of the instrument. The most powerful approach to construct validation uses Factor Analysis (Kim and Meuller, 1978), which is a method used to discover the number and nature of the underlying variables (factors) among larger numbers of measures (scales).

4.3.2 Frequency Tabulations

4.3.2.1 Profile of the IS Establishment in Government Organisations

This analysis summarises the profile of Malaysian government organisations covered by the survey, which includes the sector category, the organisation and personnel structure, and the characteristics of IS functions.

Table 4.2: Q2 - Organisation Type

SKOD organisation type

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
economy	1	30	44.1	44.1	44.1
social	2	23	33.8	33.8	77.9
security	3	3	4.4	4.4	82.4
admin./research	4	12	17.6	17.6	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

The frequency output on variable ORGANISATION TYPE shows the distributions of respondents by activity or sector. The result is summarised in Table 4.2 and it can be seen that the largest category of respondents was in the economic sector that made up 44.1% of the total, followed by the social sector with 33.8%.

Table 4.3: Q3 - Senior Executives' Rank

Q3C senior executives' rank

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
superscale	1	34	50.0	50.0	50.0
grade one	2	24	35.3	35.3	85.3
grade two	3	10	14.7	14.7	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

For senior executives' rank[14] (Table 4.3), there were 50% belonging to the superscale group with more than 25 years of working experience, 35.3% belonged to the grade 1 group with more than 20 years of working experience, while the remainder (14.7%) belonged to the grade 2 group with more than 10 years of working experience.

Table 4.4: Q4 - Respondents' Rank

Q4C respondent rank

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
grade one	2	16	23.5	23.5	23.5
grade two	3	32	47.1	47.1	70.6
grade three	4	20	29.4	29.4	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

For respondents' rank (Table 4.4), about 23.5% belonged to the grade 1 group, 47.1% were of the grade 2 group, and 29.4% were of the grade 3 group (with less than 10 years of working experience). Within these three groups, 77.9% were systems analysts by profession and the remaining 22.1% were from other professions.

Table 4.5: Q5 - Respondents' Level

Q5R respondents' level

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
IS/IT director	1	6	8.8	8.8	8.8
IS/IT manager	2	19	27.9	27.9	36.8
senior analyst	3	29	42.6	42.6	79.4
systems analyst	4	14	20.6	20.6	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

[14] Table 5.1 (p. 165) shows the Malaysian Civil Service structure in terms of employees' rank and length of service

The types of respondent chosen for this survey, heads of organisations downwards, mirror the hierarchy of IS functions in government organisations (Table 4.5). Only 8.8% held a position equivalent to IS director, which is two levels below the head of the organisation; 27.9% held the post of IS manager that is at level 3; 42.6% were at level 4 (senior analysts); and the remaining 20.6% were mostly systems analysts (with less than 10 years' working experience).

Table 4.6: Frequencies' MEAN for IS Profile Variables

Variables		MEAN
Q6	- respondent tenure	3.544
Q7	- top executive tenure	4.162
Q8	- middle executive tenure	3.265
Q10	- IS function age	13.838

Through the MEAN analysis, the following characteristics of the government organisation and its IS function can be summarised (Table 4.6). Obviously, from the MEAN analysis, it can be seen that most of the senior executives and the respondents (mostly systems analysts) serve about 3-4 years in one government department before transferring to another government department through promotion or through personal or official requests from the relevant authorities. It may also be noted that, on average, most of the IS functions within the government organisation have been established for at least 13 years.

From the above information, the profile of government organisations covered in this survey is represented with the following characteristics:

a) The majority of the respondents are senior analysts at level 4 in the organisational hierarchy,
b) The majority of the senior executives reported by the respondents are superscale officers (the highest level in the government hierarchy),

c) The economy sector is the highest respondent among the government organisations,
d) Most of the respondents and their senior executives have been in the organisation for more than 3 years, and
e) The agencies studied had been in existence, on average, for 13 years.

4.3.2.2 IS Development Process Variables (Q15-18)

The survey shows that 64.7% of IS projects in government organisations use consultants at various phases of the project. User and senior management participation were also reported high, at the high level of 88.2%. About 70.6% reported not using any project management methodology and 69.1% reported not using any systems analysis or design methodology (Table 4.7).

Further analysis shows that, out of 64.7% of projects using consultants, only 40% use project management methodology, and 36% use ISD methodology. On the other hand, of those agencies not using a project consultant (35.3%), only 8% use project management methodology and only 20% use ISD methodology.

This finding shows that, in Malaysian government organisations, methodologies are not an important feature in CBIS implementation. The higher percentage of those using project management and ISD methodologies, and user participation in agencies with project consultant, arises from the fact that all the requirements have been stipulated in the project contract. As far as policy is concerned, government organisations are not required to follow any specific methodologies for CBIS development. Eventually, this situation contributes to the lack of standardisation and makes the maintenance of CBIS difficult in government organisations.

Table 4.7: Frequencies' MEAN for ISD Process Variables

Variables		Value	Frequency	Percent
Q15	use of software consultant?	yes	44	64.7
		no	24	35.3
Q16	use of project management methodology?	yes	20	29.4
		no	48	70.6
Q17	use of systems development methodology?	yes	21	30.9
		no	47	69.1
Q18	any user and senior executive participation?	yes	60	88.2
		no	8	11.8

4.3.2.3 IS Practitioners' Perceptions Variables (Q40-44)

Generally, it was found that there is a good perception by IS practitioners of their organisations. About 73.5% reported that their senior management understood the IS goals of the organisations and 72.1% agreed that their organisation structures were appropriate. Further, about 75% agreed that their organisation support mechanisms were effective and 55.9% replied that they did not have a communication problem with the user during the IS development phase (Table 4.8).

Table 4.8: IS Practitioners' Perceptions of their Establishment

Variables		Value	Percent.
Q40	did senior management understand the IS goal?	yes	73.5
		no	26.5
Q41	did the organisation have the right structure?	yes	72.1
		no	25.0*
Q42	how effective is the organisational support mechanism (operation)?	yes	75.0
		no	20.6**
Q43	any communication problems during IS development phase?	yes	44.1
		no	55.9

* The remaining 2.9% did not response to the question.

** The remaining 4.4% did not response to the question.

d.

Among the 72.1% who agreed that their organisation had the right structure, 80% of these said that their organisations' data processing (DP) goals were clearly understood by the senior management, 82% agreed that their organisations' support mechanisms (administration and audits functions) were good, and 57% had no problem of communication with various users in the organisations during systems development.

However, among the remaining 25.0% who said that their organisation did not have the right structure, the same trend emerged with 59% of them saying that their senior management clearly understood their organisations' DP goals, 65% agreeing that their organisations' support mechanisms were good, and 53% saying they had no problem in communicating with users (see Appendix 4.6: Crosstabulation between Q41 and Q40, Q42, & Q43).

The findings show that organisational structure has no effect on the CBIS implementation process (Q40, Q42, & Q43) in Malaysian government organisations. This is because of the government set-up that is dominantly functional and physically well structured.

4.3.2.4 Senior Executives' Leadership Roles Variables (Q59a-p)

To analyse senior executives' leadership roles, four groups of the Hart and Quinn (1993) findings were applied. The results of the frequency MEAN for leadership groups of variables are summarised in Table 4.9. Detailed results of the frequency tabulation are in Appendix 4.4.

The Task Master leadership role was perceived most frequently by respondents as the main management influence, with an 88.5% frequency rating. This was followed by the Analyser role with a score of 83.6%.

Table 4.9: Leadership Roles' Frequency MEAN

Leadership Variables	MEAN	Score 4 & 5 (%)
Analyser	4.164	83.6
Motivator	4.067	71.7
Task Master	4.279	88.5
Vision Setter	4.182	78.2

4.3.2.5 Frequency Analysis for CBIS Performance Variables

The survey showed that (Table 4.10), according to the opinions expressed by 60.3% of IS practitioners, the CBIS projects were successful. It became clear through interviews with IS practitioners that, to them, "success" meant that the CBIS had been developed according to the specification requested by the top management or agreed by the users, although the project might be delayed in its implementation or incur higher costs than had been previously estimated.

However, the survey showed that higher progressive use of IT by the senior management amounted to only 32.4%. This is evidence that most of the CBIS applications in government organisations were still at the operational and tactical level rather than at the strategic level.

Table 4.10: Frequencies of CBIS Performance Variables

Variables	High/ Above Average(%) Score 4 & 5	Average (%) Score 3	Low/ Below Average (%) Score 1 & 2
CBIS Performance			
MIS Success	60.3	32.4	-
Progressive Use	32.4	50.0	17.6

4.3.3 Factor Analysis

In this study, two groups of variables are subjected to Factor Analysis in order to discover a smaller number of variables that were later labelled and used as independent variables in further investigation using bivariate or multivariate analyses.

4.3.3.1 IS Practitioners' Commitment Variables (Q45-46)

It was noted that, by separating the variables, the findings were easier to interpret than when all the variables were lumped together. For the same reason, factor analyses were performed separately for the sub-groups of questions (Q45 and Q46) to explain the correlation among the 32 scaled variables. For each group, the factor solutions were examined and only those solutions with eigenvalues >1 were selected. To enhance ease of interpretation, these factor solutions were rotated using a method called varimax orthogonal. The factors were then named and subsequently used to describe the nature and characteristics of the IS professionals' commitment towards their job, and their relationships with their superiors. Appendix 4.5 explained the factor analysis procedures.

For the "IS Practitioners' Job Satisfaction" variables three factors that explained 60.2% of the total variance were retained. Usually, for a factor analysis procedure to be effective, a minimum of 60% variance explanation is required. The relevant factor loadings, together with percentage of variance that is explained by each of the factors on this group, are shown in Table 4.11. In general, the higher the percentage of the variance being explained, the better is the factor, as this means that only redundant variables have been dropped.

Table 4.11: Factor Loadings for IS Practitioners' Job Satisfaction

Factors description and variables (loading >0.4)			loading	% of Variance explained
F1	Negative Job Satisfaction			34.1
	Q45g	Frustrating	.80345	
	Q45m	Tiresome	.80066	
	Q45j	Boring	.73818	
	Q45i	Routine	.64195	
F2	Positive Job Satisfaction			15.2
	Q45k	Creative	.76973	
	Q45n	Challenging	.76788	
	Q45a	Fascinating	.67185	
	Q45l	Pleasant	.58030	
F3	Moderate Job Satisfaction			10.9
	Q45o	Simple	.82380	
	Q45d	Respected	.57807	
				60.2

Looking at Tables 4.11 and 4.12, several important observations may be noted. Basically, it can be seen that variables loaded on one factor do not necessarily load on other factors. For example, variables Q45g, Q45m, Q45j, and Q45i, that loaded heavily on the first factor, did not load on any other factor. This is an indication that the two factors are, in fact, independent. Collinearity (a situation where factors are correlated) must be avoided as it may cause inaccuracies during further investigations using multivariate analysis. In factor analysis procedure, factor scores are usually ranked in a descending order. As illustrated in Tables 4.11 and 4.12, the first factor comprises those variables that explained most of the variances. The next factor explains less than the first but higher than the third. The size of loading indicates the correlation of the variables with the factor. In the case of the first factor, for example, variable Q45g

correlates higher than variable Q45m with this factor. Similarly, variable Q45m correlates better than variable Q45j with the first factor.

Table 4.12: Factor Loadings for IS Practitioners/ Superior Relationship

Factors descriptions and variables (loading >0.4)		loading	% of Statistical Variance explained	% of Total Variance explained
F1	Negative relationship			
Q46g	Bad	.82054		
Q46f	Stubborn	.80724		
Q46b	Impolite	-.72474		
Q46m	Annoying	.67286		
Q46q	Lazy	.61797	33.1	54.2
F2	Positive relationship			
Q46k	Influential	.78393		
Q46p	Intelligent	.72338		
Q46n	Knows job well	.72253		
Q46d	Up-to-date	.59002		
Q46h	Around when needed	.56225		
Q46c	Tactful	.51804		
Q46j	Praises good work	.46669	12.1	19.8
F3	Negative relationship			
Q46l	Doesn't supervise enough	.81471		
Q46i	Hard to please	.69253	8.5	13.9
F4	Positive relationship			
Q46a	Asks my advice	.89342	7.4	12.1
			61.1	100.0

The results of the statistical analysis of IS practitioners' relationships with their superiors are summarised in Table 4.12. The interaction between practitioners and their superiors was characterised by predominantly negative relationships. Negative

relationship factors (F1) comprised 54.2% of the total explainable variance, while positive relationship factors (F2) accounted for only 19.8% of the total variance. Aspects of direct supervision and feedback (F3 and F4) were about equal, indicating that the perceived characteristics of the first two factors were the main determinants of these perceptions, accounting for 74% of the variance in the overall relationship.

4.3.3.2 Senior Executives' Support Variables (Q48-58)

Table 4.13 illustrates the factors derived for the "executive support" group. The two factors retained in this group explained about 66.1% of the total variance. This is a reasonable variance percentage, emphasising that not much information has been lost through this procedure. From this factor analysis, the score for executive involvement and executive participation can be calculated and further analysed with the other groups of variables (e.g. crosstabulation).

Table 4.13: Senior Executives' Support Factors

	Factors Description	% of variance explained
F1	Senior executive involvement	40.3
F2	Senior executive participation	25.8
		66.1

4.3.3.3 Frequency Analysis for New Factor Variables

On completion of the factor analysis procedure, the two basic purposes of factor analysis - data reduction and data description - were fulfilled. With these reduced factors, data became more manageable and were more easily interpreted. Besides producing frequency analysis for the new composite factor variables,

crosstabulation analyses were performed to examine the relationship among the groups of variables. The results of the frequency analysis for new groups of variables that have emerged from factor analysis are tabulated in Table 4.14. Detailed results of the frequency tabulation are in Appendix 4.4.

Table 4.14: Frequencies for New Factors Variables (extracted from Factor analysis)

Variables	High/ Above Average(%) Score 4 & 5	Average (%) Score 3	Low/ Below Average (%) Score 1 & 2
Executive Support:			
Participation	39.7	44.1	16.2
Involvement	38.2	41.2	14.7
IS Practitioners' Commitment			
Executive Relationship	20.6	-	66.2
Job Satisfaction	30.9	-	61.8

The score for overall support for CBIS projects by the senior executives were low. However, the element of participation (39.7%) from them was found to be slightly higher than involvement (38.2%).

It was found that only around 20.6% of IS practitioners reported having good relationships with their senior executives. Further analyses showed that only 19% from this category of IS practitioners were satisfied with their jobs. About 76.2% of the other 66.2% of IS practitioners who said that their relationships with their senior executives were poor, reported being satisfied with their jobs (Appendix 4.6: Crosstabulation between Executive Working Relationship & Job Satisfaction).

Therefore, in government organisations as a whole, it shows that good working relationships with senior executives does not necessarily contributed to the motivation of IS practitioners towards their work.

4.3.4 Crosstabulation

The crosstabulation procedure was used, firstly, with the objective of determining whether a given observation reflected the actual patterns in the population or whether it had occurred by chance; and, secondly, to explore potential relationships between the independent variables (i.e. executive leadership roles - Table 4.15 and executive support - Table 4.16) and the dependent variables (project success, IS practitioners' perception, and progressive use of IT).

In Table 4.15, four groups of dependent variables were combined and crosstabulated against the executive leadership role and three groups of dependent variables against executive support variables in Table 4.16. In Table 4.15, it was found that executive leadership role has no significant relationship with all the dependent variables.

Table 4.15: Crosstabulation - Independent Variable of Executive Leadership Roles by Groups of Dependent variables

Variables	Chi-square	D.F.	Significance
Executive leadership roles			
Executive Support			
Q48-58 Executive involvement	1.92	6	.92655
Executive participation	1.34	6	.96926
Project Success			
Q19-39 IS project success	.49	3	.92001
IS Practitioners' Perception			
Q45 Working environment in organisation	1.96	6	.92327
Q46 Working relationship with superior	1.7	6	.93868
Progressive Use			
Q53 Use of IS/IT	1.08	6	.98225

Table 4.15 (a): Crosstabulation - Independent Variable of Executive Leadership Roles (Analyser) by Groups of Dependent variables

Variables	Chi-square	D.F.	Significance
Executive leadership roles:			
Analyser			
Executive Support			
Q48-58 Executive involvement	8.11	4	.08749
Executive participation	10.30	4	.03566
Project Success			
Q19-39 IS project success	2.62	2	.26915
IS Practitioners' Perception			
Q45 Working environment in organisation	7.43	4	.11475
Q46 Working relationship with superior	.83	4	.93379
Progressive Use			
Q53 Use of IS/IT	3.39	4	.49434

Further analysis on each type of leadership role were performed. As shown in Table 4.15 (a), for the Analyser type of leadership role, crosstabulated with four groups of variables, one variable (executive participation) was identified as having reasonably high Chi-square values at a 95% confidence level (.05). These results indicate that the relationship between these independent and dependent variables did not occur by chance.

For the Motivator type of leadership role (Table 4.15 (b)), it was found that only two variables (executive involvement and executive participation) could be identified as having high Chi-square values at the 95% confidence level.

Table 4.15 (b): Crosstabulation - Independent Variable of Executive Leadership Roles (Motivator) by Groups of Dependent Variables

Variables	Chi-square	D.F.	Significance
Executive leadership roles: Motivator			
Executive Support			
Q48-58 Executive involvement	19.42	4	.00065
Executive participation	11.12	4	.02515
Project Success			
Q19-39 IS project success	.63	2	.72900
IS Practitioners' Perception			
Q45 Working environment in organisation	3.04	4	.54991
Q46 Working relationship with superior	6.11	4	.19087
Progressive Use			
Q53 Use of IS/IT	9.73	4	.04509

Table 4.15 (c): Crosstabulation - Independent Variable of Executive Leadership Roles (Task Master) by Groups of Dependent Variables

Variables	Chi-square	D.F.	Significance
Executive leadership roles: Task Master			
Executive Support			
Q48-58 Executive involvement	18.76	4	.00087
Executive participation	11.37	4	.02270
Project Success			
Q19-39 IS project success	2.64	2	.26714
IS Practitioners' Perception			
Q45 Working environment in organisation	2.83	4	.58611
Q46 Working relationship with superior	5.90	4	.20667
Progressive Use			
Q53 Use of IS/IT	3.09	4	.54164

For the Task Master type of leadership role (Table 4.15 (c)), only two variables (executive involvement and executive participation) were crosstabulated to give the high Chi-square value of 95%.

For the Vision Setter type of leadership role (Table 4.15 (d)), none of the variables showed high Chi-square values either at 95% or at 90% confidence levels.

Table 4.15 (d): Crosstabulation - Independent Variable of Executive Leadership Roles (Vision Setter) by Groups of Dependent Variables

Variables	Chi-square	D.F.	Significance
Executive leadership roles:			
Vision Setter			
Executive Support			
Q48-58 Executive involvement	6.79	4	.14688
Executive participation	2.90	4	.57353
Project Success			
Q19-39 IS project success	3.16	2	.20582
IS Practitioners' Perception			
Q45 Working environment in organisation	2.96	4	.56421
Q46 Working relationship with superior	3.76	4	.43815
Progressive Use			
Q53 Use of IS/IT	4.66	4	.32387

For executive support groups (Table 4.16), only two variables (working relationship with superior and use of IS/ IT) had high Chi-square values at 95%. Table 4.16 also shows the results of the crosstabulation as the level of relation of measurable features that might be expected to become apparent through the actions relating to executive participation roles.

Table 4.16: Crosstabulation - Independent Variables of Executive Support by Groups of Dependent Variables

Variables	Chi-square	D.F.	Significance
Executive support: Involvement			
Project Success			
Q19-39 IS project success	1.54	2	.46322
IS Practitioners' Perception			
Q45 Working environment in organisation	2.85	4	.58259
Q46 Working relationship with superior	11.14	4	.02508
Progressive Use			
Q53 Use of IS/IT	11.68	4	.01986
Executive support: Participation			
Project Success			
Q19-39 IS project success	1.24	2	.53863
IS Practitioners' Perception			
Q45 Working environment in organisation	3.82	4	.43130
Q46 Working relationship with superior	1.93	4	.74801
Progressive Use			
Q53 Use of IS/IT	4.93	4	.29504

In addition to Table 4.15 (c), Table 4.17 (a) shows the results of a typical crosstabulation output (based on variable executive involvement). It can be observed from this that for executive involvement specifically, the Chi-square value of 18.76 was significant at a 0.00087 level. This is an indication that the observation reflects the true pattern within the Task Master type of leadership role, and that a relationship exists between the variable executive involvement and Task Master type. In this particular case, for example, 42.1% of senior executives of the Task Master type had high involvement correlations. In Table 4.17 (b), similar findings became apparent from the results of the analysis of the Motivator type (of which 39.3% had a high involvement relation). No significant relationship could be found between the Analyser and Vision Setter types towards senior executive involvement.

In the case of executive participation by the Analyser type (Table 4.17 (c)), it was found that 37.7% of these senior executives had a high level of participation in CBIS operations. The Task Master was characterised by a 42.6% participation with the Motivator at 35%. No significant relationship was established between the Vision Setter type and senior executive participation (see Appendix 4.6).

For progressive use of IS/IT (Table 4.18), almost 22% of the senior executives were high in involvement and usage of IS/IT. However, a high level of involvement by senior executives does not appears to contribute to a good working relationship with IS practitioners. In Table 4.19, it can be seen that only 15.6% of IS practitioners recorded good relationships compared to 18.8% of IS practitioners recorded bad relationships with highly involved senior executives.

The results of the crosstabulation procedure provided the researcher with a quantitative assessment of relationships among the four groups of dependent variables and the two groups of independent variables. It revealed the characteristics and preferences between each variable and provided the researcher with objective findings and a directed method of understanding the executive leadership roles and executive support variables. It also showed how the IS practitioners respond towards these variables, motivated by their personal opinions and perceptions. Although most of the variables had low significance values (greater than a 0.1 significance value, i.e. less than a 90% confidence level), the researcher believes that the variables with high significance values reflect the true situation and do not emerge by chance. Details of the results of the crosstabulation analyses are shown in Appendix 4.6.

Table 4.17 (a): Crosstabulation output (Executive Involvement by Task Master)

RI1 exec. involvement by CTM Task Master

CTM Page 1 of 1

RI1	Count / Row Pct / Col Pct / Tot Pct	1	2	3	Row Total
1.00 low		2 25.0 100.0 3.5	2 25.0 40.0 3.5	4 50.0 8.0 7.0	8 14.0
2.00 average			3 12.0 60.0 5.3	22 88.0 44.0 38.6	25 43.9
3.00 high				24 100.0 48.0 42.1	24 42.1
Column Total		2 3.5	5 8.8	50 87.7	57 100.0

Chi-Square	Value	DF	Significance
Pearson	18.76440	4	.00087

Table 4.17 (b): Crosstabulation output (Executive Involvement by Motivator)

RI1 exec. involvement by CMV Motivator

CMV Page 1 of 1

RI1	Count / Row Pct / Col Pct / Tot Pct	1	2	3	Row Total
1 low		1 12.5 100.0 1.8	5 62.5 33.3 8.9	2 25.0 5.0 3.6	8 14.3
2 average			9 36.0 60.0 16.1	16 64.0 40.0 28.6	25 44.6
3 high			1 4.3 6.7 1.8	22 95.7 55.0 39.3	23 41.1
Column Total		1 1.8	15 26.8	40 71.4	56 100.0

Chi-Square	Value	DF	Significance
Pearson	19.42186	4	.00065

Table 4.17 (c): Crosstabulation output (Executive Participation by Analyser)

RP1 exec. participation by CAN Analyser

RP1	Count / Row Pct / Col Pct / Tot Pct	CAN 1	CAN 2	CAN 3	Row Total
1.00 low		1	3	3	7
		14.3	42.9	42.9	11.5
		33.3	42.9	5.9	
		1.6	4.9	4.9	
2.00 average		1	3	25	29
		3.4	10.3	86.2	47.5
		33.3	42.9	49.0	
		1.6	4.9	41.0	
3.00 high		1	1	23	25
		4.0	4.0	92.0	41.0
		33.3	14.3	45.1	
		1.6	1.6	37.7	
	Column Total	3 4.9	7 11.5	51 83.6	61 100.0

Chi-Square	Value	DF	Significance
Pears n	10.30072	4	.03566

Table 4.18: Crosstabulation (Progressive use of IT/IS by Executive Involvement)

QR53 Pr gressive Use of IT by RI1 exec. involvement

QR53	Count / R w Pct / C l Pct / T t Pct	RI1 l w 1.00	RI1 average 2.00	RI1 high 3.00	Row Total
1 bel w average		4	6	1	11
		36.4	54.5	9.1	17.2
		40.0	21.4	3.8	
		6.3	9.4	1.6	
2 average		5	15	11	31
		16.1	48.4	35.5	48.4
		50.	53.6	42.3	
		7.8	23.4	17.2	
3 above average		1	7	14	22
		4.5	31.8	63.6	34.4
		10.0	25.0	53.8	
		1.6	10.9	21.9	
	Column Total	10 15.6	28 43.8	26 40.6	64 100.0

Chi-Square	Value	DF	Significance
Pearson	11.68437	4	.01986

Table 4.19: Crosstabulation (Working Relationship by Executive Involvement)

Exec. working relationship by RI1 exec. involvement

RI1 Page 1 of 1

C46T	Count / Row Pct / Col Pct / Tot Pct	low 1.00	average 2.00	high 3.00	Row Total
bad r'ship	n	10	20	12	42
		23.8	47.6	28.6	65.6
		100.0	71.4	46.2	
		15.6	31.3	18.8	
no response	x		4	4	8
			50.0	50.0	12.5
			14.3	15.4	
			6.3	6.3	
good r'ship	y		4	10	14
			28.6	71.4	21.9
			14.3	38.5	
			6.3	15.6	
	Column	10	28	26	64
	Total	15.6	43.8	40.6	100.0

Chi-Square	Value	DF	Significance
Pearson	11.13553	4	.02508

4.4 Quantitative Survey's Major Findings

The results gained through the quantitative survey using survey questionnaires have partly answered the first research question of this study, namely: How and to what extent does the senior executives' influence affect the development process of CBIS? The survey has also satisfied the first objective of the study, namely: to understand the senior executive's influence (executive support and leadership role) and its relationship to the CBIS performance.

The statistical analyses using the survey data were applied to discovering and assessing the mechanisms of leadership styles that are claimed to be key components in the critical area of organisational strategies which direct technology functions and investments. The analyses involve the process of data filtration, precipitation, and

crystallisation of the identifiable value relationships. Table 4.20 summarises the crosstabulation findings by highlighting the high, low or average influence between executives' support, executives' leadership role, and senior executives-IS practitioners working relationships.

Table 4.20: Crosstabulation Summary - Executive Support by Executive Leadership & CBIS Performance

Grouped Variables	Executive Support:	
	Involvement	Participation
Executive Leadership Role:		
Analyser		average
Motivator	high	high
Task Master	high	high
Vision Setter		
CBIS Performance:		
Project Success		
Progressive use of IT/ IS	average	
IS Practitioners' perceptions:		
Working relationships	low	
Working environment		

The accrual of the various alliances of the factors involved were developed into major findings as follows:

a) Within Malaysian governmental agencies, the strategic impact on the ISD function emanates predominantly from the adopting of Task Master leadership roles, augmented to a lesser extent by Analyser leadership influences. Less apparent was the impact of the Motivator role, although the motivational effects were more in evidence than the supplementary influence of the faculties attributed to the Vision Setter (see Table 4.9).

b) Although executive participation weighed more heavily than executive involvement, the final summation of the overall executive support resources transmitted into the ISD process was only tangibly identifiable at an average level (Table 4.14).

c) Overall, however, the findings in (a) and (b) indicate that Malaysian government agencies proclaim strategic leadership styles that exhibit the trait of executive involvement levels lower than participation levels. This finding is conjugate with the predominantly Task Master-oriented leadership strategies adopted by the agencies.

d) CBIS performance levels, measured as the aggregates of project success ratings, were higher than average, although the progressive use of technology resources by senior executives represented a utilisation below the average of assessed usage potential (Table 4.10).

e) IS practitioners' allegiances to their senior executives and the general levels of job satisfaction were isolated and found to be characterised by below-average profiles (Table 4.14). This may have been the outcome of an inherent or general restrained attitude by top management towards IS projects. It may also have been because of a defensive and pacific attitude among IS practitioners, causing a failure in the task of promoting and legitimising the benefits of their IS projects.

f) A higher investment in executive involvement and executive participation was identified as the more measurable characteristics of the Task Master and Motivator tactical approaches to empowering technology functions (Tables 4.15 (b) & (c), and Table 4.20).

g) Extended analysis measured the effects of a high qualitative involvement and focus by senior executives in IS projects (Table 4.20). It also displayed a negative correspondence in enhanced working relationships between senior executives and IS

practitioners (Table 4.19), but a high degree of inclination towards using CBIS by executives (Table 4.18).

Table 4.21(a): Empirical Findings on the Task Master Executive Leadership Role

Variables:	Executive Leadership Role		
	Task Master	**Behavioural/ Theoretical Characteristics**	**Organisational/ Empirical Survey Characteristics**
Task Master		• concern about performance and result • influencing decisions made at lower levels • serving full range of external stakeholders • contributing specific knowledge and opinions about problems • making trade-off decisions and allocating resources accordingly	• this leadership role was reported to be the highest (88.5% of senior executives) with high Task Master role following
Involvement	high	• senior executives' views of IT/ IS as critical to organisation's success	• about 38.2% reported high involvement and 41.2% reported an average involvement
Participation	high	• personal intervention by senior executives • spending notable amount of time in managing IT/ IS function	• about 39.7% reported high participation and 44.1% reported an average participation
Progressive Use		• use of CBIS by senior executives	• only about 32.4% reported high usage and 50% reported an average usage.
Working relationships with IS practitioners		• the morale of IS practitioners	• about 20.6% reported having good working relationships with senior executives and 66.2% reported having poor relationships

Table 4.21(b): Empirical Findings on the Analyser Executive Leadership Role

Variables:	Executive Leadership Role		
	Analyser	**Behavioural/ Theoretical Characteristics**	**Organisational/ Empirical Survey Characteristics**
Analyser		• focusing on efficient management of the internal operating system • setting the context and shaping the decisions made by the operating system • critical review and evaluation of proposed projects and programs • working to integrate conflicting perspectives and unpopular views • forcing subordinates to think about problems in new ways	• this leadership role was reported to be the second highest (83.6% of senior executives) with high Analyser role following
Participation	average	• personal intervention by senior executives • spending notable amount of time in managing IT/ IS function	• about 39.7% reported high participation and 44.1% reported an average participation

The levels of participation and involvement of the two main management roles identified are shown in Tables 4.21 (a) and (b). The most frequently occurring role of the Task Master shows a significant association with the variables of participation and involvement. The second most frequently occurring role, that of the Analyser, shows a significant level of participation, as an associated characteristic. The statistical methods used to produce the major findings involved the use of frequency tabulations, factor analysis, and crosstabulation, which provided the justification for the formulation of three additional propositions, which are presented in Table 4.21 (c).

Those propositions are further summarised in the form of six issues, as shown in Table 4.22, and are to be investigated by the case studies in the next chapter.

Table 4.21 (c): Propositions Derived from Survey Findings

Survey Findings	Propositions	Related Propositions
• Statistically, it was found that the executive leadership role and executive support levels were not in evidence as factors contributing to successful CBIS performances • Further, evidence from survey findings shows that executive support contributes to the progressive use of IT, and IS practitioners' working relationships.	• It is believed that senior executives' perspectives on the value of CBIS contributions to organisational success, and their ability to communicate with IS practitioners are the determining factors in the level of senior executive support ultimately provided. • CBIS performance may be improved if IS practitioners could recognise and identify their senior executives' perceptions of organisational success and its relationship to the CBIS project.	This is related to Ein-Dor & Segev proposition (Table 2.3), which states that: • "the level of involvement of top management is dependent on their appreciation, understanding, motivation, and perceptions of MIS."
• The executive leadership roles of Task Master, Analyser, and Motivator tend to give support in the form of executive participation.	• Since Task Master is the dominant leadership role in government organisations, higher executive participation may contribute to a better or poorer CBIS performance. Thus, it is believed that CBIS performance may be improved if reasons or preferences for executive participation are known.	This proposition can be related to Ein-Dor & Segev's propositions: • "High levels of top management association with MIS increase the likelihood of success." and • "The level of association of top management with MIS is related to the amount of time devoted and to the number of functions performed." (Table 2.3).

Table 4.21 (c) continued

Survey Findings	Propositions	Related Propositions
• The executive leadership roles of Task Master and Motivator tend to give support in the form of executive involvement. • High executive involvement was found to have a positive influence on senior executives' progressive use of CBIS but have a negative influence on working relationships with IS practitioners.	• It is believed that CBIS performance may be improved if reasons for executives' involvement can be further investigated, particularly, the Task Master leadership role.	This proposition relates to the following Ein-Dor & Segev's propositions: • "High levels of manager-MIS association promote mutually favourable perceptions between IS staff and users and commonly favourable perceptions of IS," and • "The better the communications between top management and MIS staff, the greater the likelihood of MIS project success." (Table 2.3).

Table 4.22: Major Findings of the Quantitative Survey.

- domination of Task Master leadership roles
- poor relationship between senior executives and IS practitioners
- lower job satisfaction among IS practitioners
- poor communication among the stakeholders
- average senior executives' support for the ISD process (executive participation vs. executive involvement)
- although above-average IS project success have been perceived by stakeholders, usage of CBIS by senior executives is always low

4.5 Chapter Summary

By statistical analysis of the survey data, the relationships between the independent variables of leadership styles and the dependent variables of the perceived effects on IS functions and practices have been quantitatively established. By this means, an understanding has been gained of which aspects of leadership style are likely to affect particular perceptions and actions within the IS processes. This contributes to a recognition of how and in what way the perceptions and actions of IS practitioners are being influenced by the leadership roles of senior executives. Because these relationships have been quantitatively assessed, the analysis of the survey data makes a further contribution to recognising and understanding the extent to which executive influence affects IS practitioners' behaviour and the IS process in general. In this way, the requirements of the first objective of the research study have been met, and the resulting observations are further linked in later chapters to those drawn from the qualitative analysis of the results of the case study projects.

In focusing on the first objectives of the research work, potential contributions towards enhancing the IS implementation process have been identified. Besides the formulations about leadership factors other important behavioural elements were observed during the work of consolidating and examining the survey data, the significance of which needs to be investigated with further qualitative studies.

It should be emphasised that the results of the statistical analyses, although valuable and of interest in establishing behavioural patterns, only represent the likely behavioural patterns that can be expected in the operations of government organisations. The statistical findings cannot be expected to uncover every aspect of the day-to-day formal and informal interactions, environment, and real world situations. Normally, such aspects arise during the ongoing process of organisational evolution, and while adapting strategies and tactics to meet situations involving change and possibly unforeseen or uncertain outcomes.

To understand how real world effects influence the IS functions, and how existing practices, senior executives, and IS practitioners interact and react to these influences, two qualitative case studies were conducted. These case studies sought to identify and describe importance perceptions, existing behavioural aspects, and emerging behavioural patterns that may be appropriate or conducive to the longer-term development of IS and personnel.

The quantitative findings from the survey analyses provided useful guidelines about the factors that should be measured rather than what are thought to be the correct measures according to traditional thinking and conventional wisdom. Therefore, a contribution can be made to policy designs once case study information has been examined and triangulated with the results of the survey.

The questionnaire survey in Phase 1 helped to fulfil the first objective of the study: to understand the senior executives' influence and their relationship to the IS implementation process. Phase 2 fulfilled the second objective of this research, which was to understand the underlying reasons for the existing practice of IS implementation process by IS practitioners and senior executives in government organisations from their respective worldviews.

In the following chapter the survey findings are further explored through case studies, which will further refine the conceptual model. The approaches adopted in the case study is to describe the analysis and results, and the relationship of these to the survey results. Most importantly it will be shown how the case study findings are supported by the findings from the survey and what interpretations can be placed on this highly significant convergence of the separate lines of investigation adopted in the research study.

5 The Case Study: CBIS Implementation Processes in Government Organisations

The inter-relationship of the previous chapters, and the relevance of case study work within the overall research design is shown in Figure 5.1. Chapter 1 defined the problem situation and examined the issues involved in undertaking this type of research work. Chapter 2 examined the tools that are extant and their characteristics that make them appropriate to an investigation of the problem situation. Chapter 3 examined the processes involved in formulating a research design. Chapter 4 represented the first phase of the design implementation, and Phase One of the actual research investigations, by means of a questionnaire survey. The current chapter discusses Phase Two of the research investigations, which involves case studies. This chapter of the thesis provides triangulation with the survey results described in the previous chapter, and with the interpretative understandings and reflections documented in Chapter 3.

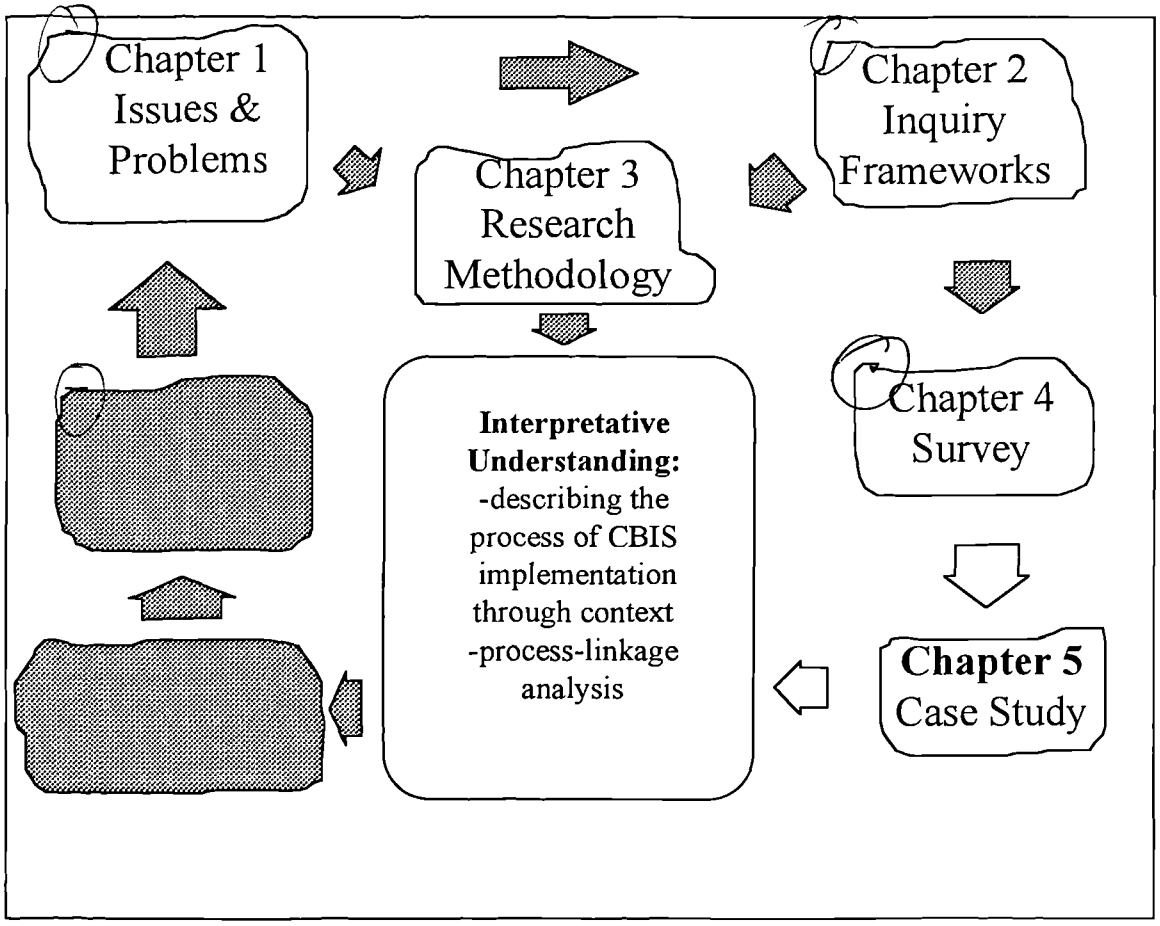

Figure 5.1: Chapter 5 Research Processes

Since the earliest days of computerisation, the government has promulgated guidelines and procedures for the public sector through its central agencies. The processes of CBIS implementation over a twenty-year period are described. This is partly to answer the first research question and also to fulfil the second objective of the study: to understand the Malaysian government's CBIS policies and their implementation's impact on various stakeholders.

The two operating agencies' CBIS projects explored - NALIS (the National Land Information System) of the Ministry of Land and Co-operative Development; and IIS (the Immigration Information System) of the Immigration Department - are the two systems that provide informational support for information management at the national and state levels.

5.1 Overview of the Malaysian Government Organisations

5.1.1 The Establishment

The constitution of the Malaysian state is that of a parliamentary democracy. Policy and administration operate through a system of federal, state, and local government organisations. This research work concerns itself with the highest level of policy making and with policy implementation at the highest level of government within the federal structure.

Government policy is directed towards providing effective public services and stimulating the private sector through policy directives, incentives, co-operation, and advice. Because of the conflicting demands on public expenditure, the Malaysian government organisations (MGO) have sought to enhance the decision-making process by establishing various consultative bodies and steering committees with members drawn from a wide range of internal and external organisations.

- **Role and Structure**

The role and structure of the Malaysian government have been characterised by evolutionary change from a former British Colony to a modern independent state. Although the government inherited some characteristics of the British government administrative system, the main characteristic is the government's two-tier administrative organisational structure. Ministries and their departments exist at the federal level with a second tier of state departments, which co-exist to implement a system of national administration (Hussain, 1986).

Before independence in 1957, the role of government organisations was simpler, being limited to maintaining law and order and collecting revenue. Following independence, the additional tasks of national economic and social development, maintaining stability, and adapting to change became government priorities. The government sees itself as a manager of public resources and a provider of public services.

The term "Public Services" is defined in Article 132 of the Federal Constitution as including the General Public Service of the Federation, the Public Service of the States, Joint Public Service Organisations, the Judicial and Legal Services, the Police Force, and the Armed Forces. Statutory bodies and Local Authorities are not included within the definition, but operate in the same way as other public service organisations. Each public service organisation is a legal entity that operates in an autonomous way in decision-making, implementing national and devolved policies, and in making public appointments. However, the definition was broadened in the Sixth Malaysia Plan (1990) when the definition of Public Service organisations included quasi-government bodies: "The public sector comprises the Federal Government, State Governments, Local Governments and Non-Financial Public Enterprises (NFPE)."

Although integrating all government and quasi-government organisations into a single perception, organisationally the MGO structures remain large and complex. There are 13 state governments, 5 local governments, and 41 NFPEs[15], within a hierarchical structure whose functional and service activities are guided by the relevant federal ministries.

According to Zakaria (1982), the Malaysian public service organisations are under the direct control of the executive and they perform the tasks of implementing the daily affairs of the nation (Figure 5.2). Ministries are administrative organisations

[15] Source: *Information Malaysia 1995 Yearbook* (p.282).

formed at the federal level to implement national administration efficiently, effectively, and smoothly (Hussain, 1986). Because of the two-tier system of government, communication is an important issue, not the least because of the geographical spread of state administrations, and the need for co-ordination in policy implementation is paramount. Because of these considerations, certain ministries act as central agencies, which co-ordinate overall administrative matters and are involved in planning for central government. This is done by the appointment of an executive, and of steering and advisory committees with attendees and representatives from internal and external organisations.

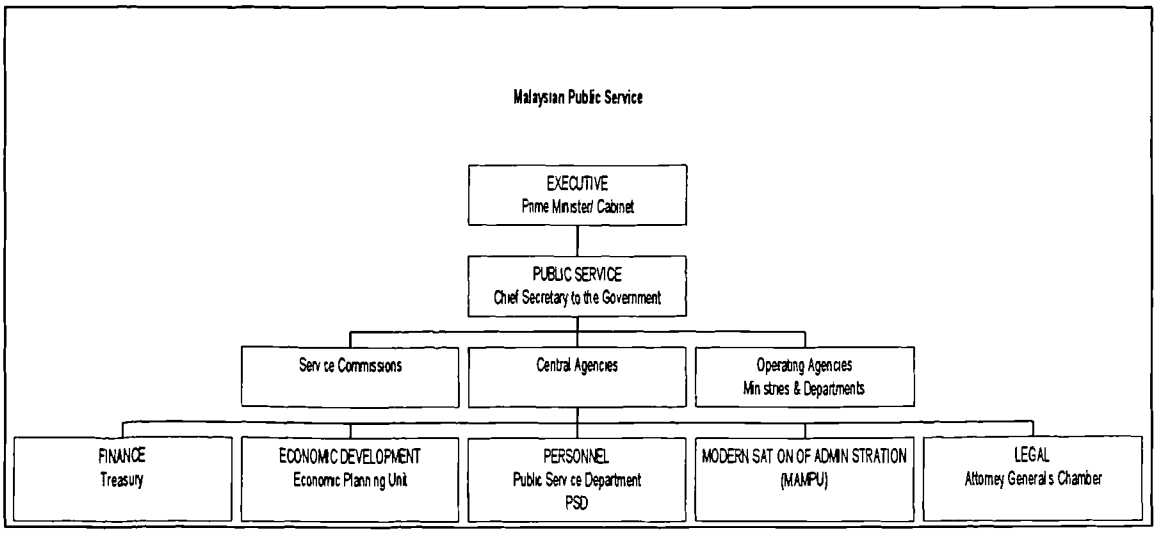

Figure 5.2: Federal Government Organisation, Malaysia

The structure of the Prime Minister's Department (PMD) reflects the emphasis on co-ordination, communication, and planning (Figure 5.3). The PMD is a ministry in its own right. It is this "inner circle" of "central agencies" that forms the centres of executive power and co-ordinates overall activities within the structure of MGOs. The remaining 23 ministries exist, but are concerned with functional and service matters. These ministries are also known as the "operating agencies".

A significant feature of MGO is its huge and firmly established civil service. In 1990, those employed in the government services accounted for 15% of the total

employed labour force (Sixth Malaysia Plan, 1990). This sector is the second largest job generator, so that during the period 1985-1990, it accounted for about one quarter of the public sector.

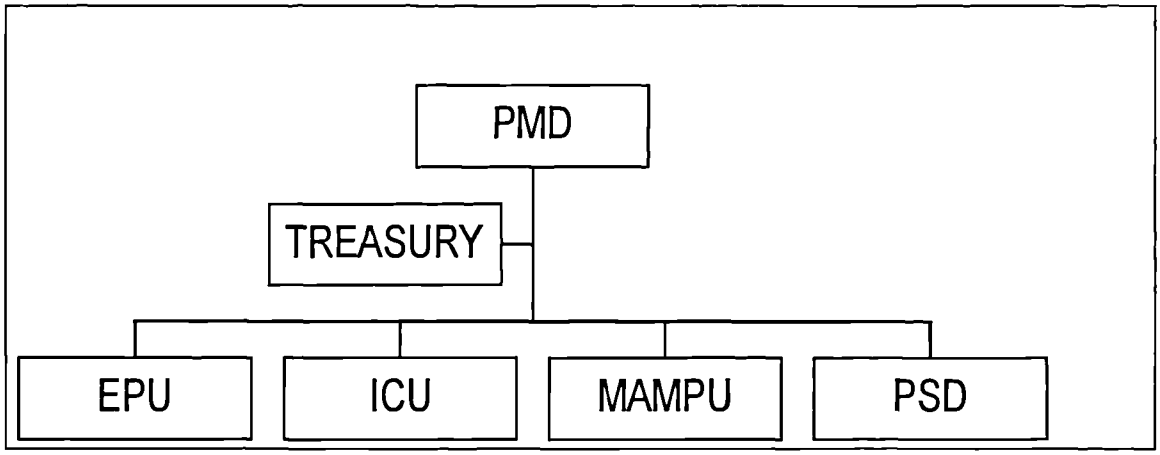

Figure 5.3: Prime Minister's Department, showing Policy-Making Agencies

LEGEND: EPU: Economic Planning Unit ICU: Implementation Co-ordination Unit
MAMPU: Management Modernisation Unit PSD: Public Services Department

- **The Executive**

The "executive", according to *Chambers' Dictionary*, is one who performs, administers or manages. Drucker (1967) defined executives as those "knowledge workers, managers, or individual professionals, who are expected, because of their position or their knowledge, to make decisions in the normal course of their work that have significant impact on the performance and results of the whole." From these definitions, it appears that the term "executive" is synonymous with "manager". The two terms will be used interchangeably in this study.

Executives or managers exist at each level of the organisation. This recurrence is important to our study where discussion centres around the MGO, which reflects management at the top level. At this high level, for instance, executives hold the power or authority in government to carry the law into effect. At lower corporate, divisional, unit, or subunit levels, respective executives perform the same kind of executive tasks,

although the tasks are within specific functions depending on the functional breakdown of the sub-organisations managed.

In Malaysia, the highest executive power resides with the Head of State according to the definition contained within the Malaysian Federal Constitution (1986):

> The executive authority vests in the Ruler (Yang di Pertuan Agong) on the advice of the Cabinet or Minister responsible, with the exception of certain discretionary matters.

The Head of State appoints the Prime Minister based on the qualification of the appointee's ability to form a majority government. The qualification for the PM is that he is able to rely on the support of the majority of the members of the House of Representatives. When appointed, the PM will chose his ministers from Members of Parliament and select from these ministers a Council of Ministers, which is his Cabinet. The Cabinet becomes the highest policy-making and decision-making body in the MGO structure, the PM acting as chairman. The PM also chooses a Cabinet Secretary, who is invested with the title of Chief Secretary to the Nation (CSN). Actual appointments are made by the Ruler, on the advice of his PM.

The main task of the Cabinet is decision and policy making. The issuing of policy directives and the administration surrounding this task is the responsibility of the CSN, who acts as a chief executive in the administration of policy issues. Cabinet ministers function as top executives in their own ministries, although, in practice, management of the individual ministries and other MGO departments and statutory bodies is the responsibility of the Secretary-Generals (SGs) and Director-Generals (DGs) of these bodies. In practice, the SGs and DGs can be regarded as the chief executive officers of their respective departments and organisations.

The chief concern of the SGs and DGs is to ensure that parliamentary decision-making is implemented with policy directives and the mandatory requirements that derive from statutes and legal processes. At lower levels within the MGOs, senior executives are more concerned with the day-to-day tasks that arise in their particular areas of responsibility and authority.

Table 5.1: Malaysian Civil Service Structure

Position	Rank	Length of Service
Chief Secretary	Staff I	Above 30 Years
Secretary-Generals	Staff II, Staff III	20-30 Years
State Secretary	Superscale A	"
Director-Generals	Superscale B,	"
Deputy Secretary-Generals	Superscale C	"
Deputy Director-Generals	Grade I	20 Years
Directors/ Managers	Grade II	15-20 Years
Officers	Grade III	10 Years & below

Within the civil service grade structure (Table 5.1), these chief executives are at the apex of the hierarchy. The grades of the Secretary-Generals of the Federal Ministries range from the top grade of Staff I to Superscale C. The Director-Generals of Federal Departments vary in grade from Staff II to Grade I. The State Secretaries of the State Administrations vary in grade from Superscale B to Grade I. The highest grade of the chief executives of the State Economic Development Corporations is Superscale B and the lowest is Grade I. The Mayor of Kuala Lumpur is the highest graded, at Staff III, while the lowest grade of the Municipality President is Grade II.

Translating these grades into length of service, the Grade I officers have accumulated an average of twenty years of relevant working experience in and outside their present organisations, while Staff I officers have more than thirty years of service record.

5.2 Malaysian Government Computerisation

Although the MGOs' involvement in computerisation can be traced back to the mid 1960s, the real growth of installations began following 1972. The number of major installations is shown in Figure 5.4.

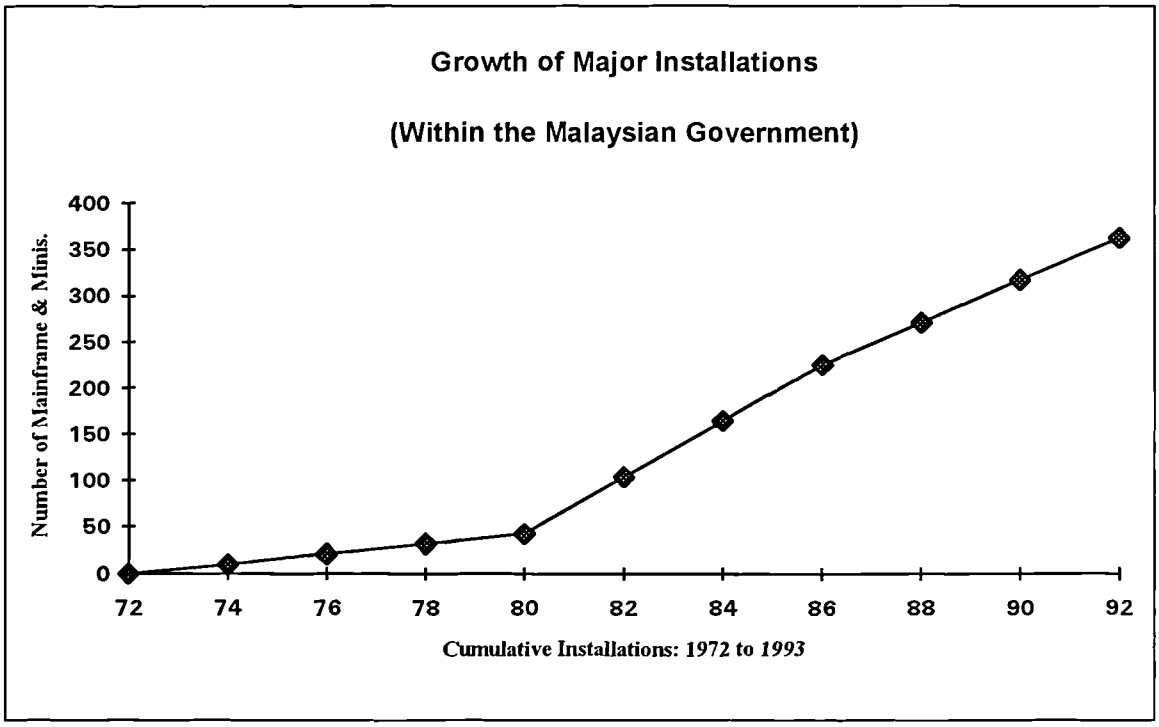

Figure 5.4: Growth of Major IT Installations

The graph shows the trend of major installations, which are defined as mainframe and minicomputer installations. Published statistics (Abdullah, 1992,1993; Venugopal, 1990) have been used to show the evolutionary trend from batch-mode processing, through MIS interactive developments, to networking and distributed data processing (DDP) systems.

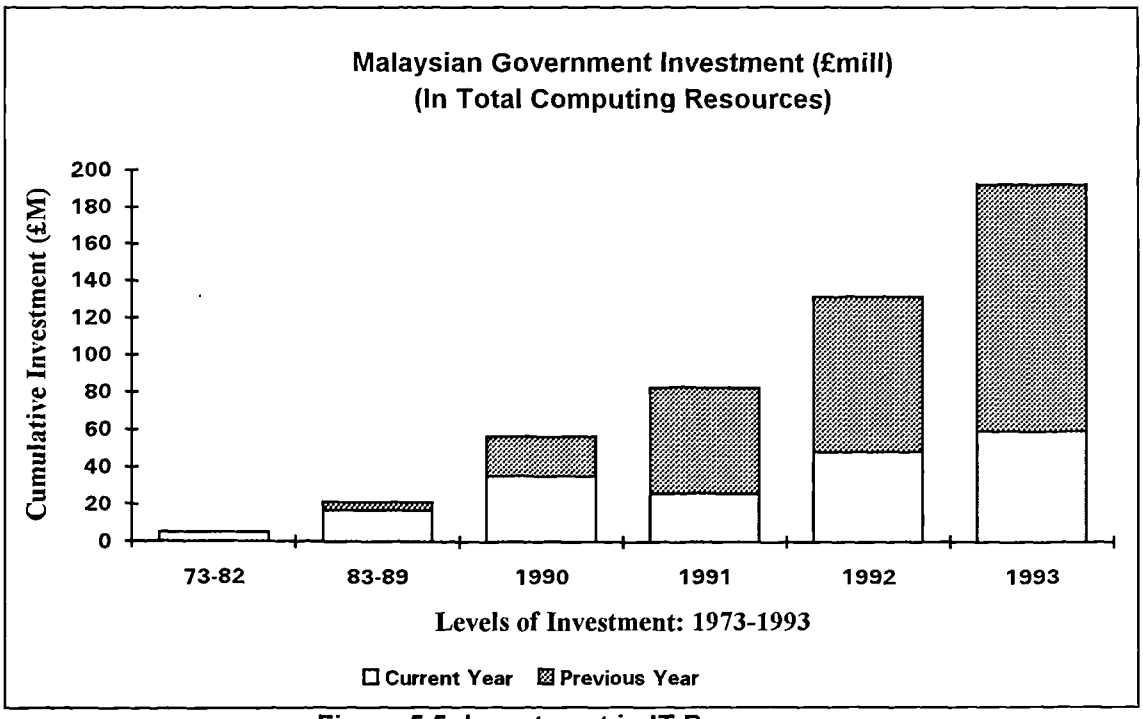

Figure 5.5: Investment in IT Resources

The same statistical sources have been used to show the annual investment made from 1990 to 1993 in overall computing resources, and the cumulative investment since 1972 (see Figure 5.5). Three major projects had been undertaken before 1972. The first project undertaken in Malaysia was the computerisation of the accounting and payroll routines at the National Electricity Board in 1965. In the following year, computer systems were installed at the Statistics Department to log and consolidate population census data. In the same year, a system was installed at the Inland Revenue Department (IRD) for the purpose of issuing tax returns, controlling tax collection, for general accounting, and for compiling tax statistics and summaries.

Further batch-mode applications were developed in the public sector involving accounting, payroll and personnel records. Even so, by 1972, only 77 systems analysts and programmers were employed in the public sector. In the mid 1970s, management information systems (MIS) began to be introduced centrally in stand-alone configurations. The introduction of networked and DDP systems in the mid 1980s enabled systems to link across geographical areas. Dispersed offices of the IRD were

linked into the central office at Kuala Lumpur, and a project was undertaken to network the Employees Provident Fund (EPF). Networked and DDP systems continue to be implemented. A total of 362 mainframe and minicomputer installations were in operation within the MGOs in 1992, supported by 1,775 systems analysts and programmers.

The Sixth Malaysia Plan (1990) recognised the importance of these development, and incorporated a mission statement for IT developments, which included five main objectives:

a) to enhance the productivity of operational functions of government;
b) enhance managerial effectiveness;
c) to promote the availability and accessibility of information;
d) to develop an IT infrastructure; and
e) to assist in the creation of an information-rich society.

In line with these strategic objectives, the Malaysian government has placed tactical emphasis on the development of standards and practices, database development in support of DDP development, data security, a government data network, personnel development, and a programme in support of IT awareness and promotion.

5.3 The Central Agencies

5.3.1 Public Service Department (PSD)

The PSD has a high profile within the MGO structure and is a department within the PMD ministry (see Figure 5.3). The objective of the PSD is to maximise the opportunities and benefits that can be gained by judicious use of personnel, which are supported by appropriate infrastructures. The high profile nature of this function is in

line with the various mission statements made by Malaysian government leaders. It implies that personnel are not to be regarded as a "factor of production" to be optimised, minimised, and/ or eliminated, but that personnel should become the primary source of value added contributions within the MGOs.

The PSD has wide-ranging authority in personnel matters covering the whole of the Public Service, which, in practice, means authority in all functions within the MGOs. It formulates and implements grading structures, pay scales, terms and conditions of employment, appointments, transfers, promotions, and career planning. The PSD has not only authority in breadth, but also in depth, and its responsibilities cover the lowest-paid workers within MGOs.

In real-world situations, the PSD has not been effective in creating the conditions necessary to job satisfaction and career development, particularly in areas of IT where the aspirations of skilled "knowledge workers" have not been fulfilled. This has impacted not only on the levels of job satisfaction felt by IT practitioners, but also on the effectiveness of their skills during IS implementation.

Instances occur where Administrative Officers are placed in positions of authority in IT personnel affairs. Because Administrative Officers have had no training or practical experience in IT, appointments and transfers of personnel can take place based on uninformed judgements regarding the nature of these appointments. This affects the morale of IT practitioners directly and indirectly, as they cannot perceive a secure career development path based on rewards for their efforts. Staff changes interfere with the implementation of IT projects and this problem is compounded by lack of adequate training programmes.

The PSD has the responsibility for authorising and arranging appropriate training programs. In practice, training is done within the IT departments themselves

when time and resources can be found to do this. National Institute of Public Administration (INTAN) has training resources and is able to provide general levels of skills training through their National Computer Training Centre. Even so, there is always a time lag and scheduling problems which cause further delays in implementing IT projects.

5.3.2 Malaysian Management Modernisation Unit (MAMPU):

Much of the responsibility for administering the IT policy directives in the Sixth Malaysia Plan comes within the control of the MAMPU. This central agency, like the PSD, is a high-profile organisation inside the PMD ministry (see Figure 5.3). While the function of the PSD is that of personnel management, the MAMPU is more systems-oriented. It is concerned with establishing policy, policy guidelines, and procedures in support of IT projects. Its main objective is to enhance the effectiveness and quality of the overall public service by creating and implementing standards, and ensuring that a systems infrastructure exists and is in good working order.

It provides consultancy services, feasibility studies, updates, and analyses on new technologies, and authorisation for computer purchases and upgrades. It is the highest executive authority on organisational development, structuring, organisational efficiency, restructuring, and administrative reforms. Because it is a central agency within the PMD, it has the requisite authority to carry through these policy directives and guidelines. It also has the authority to enforce any perceived changes that are thought to be necessary in the interests of effectiveness in line with the policy direction provided by the Sixth Malaysia Plan and other directives.

The formal structure of the PMD (Figure 5.3) implies the correct structure for the successful development of IT projects and work practices. The structure, at this level, implies clarity of responsibility supported by a high level of authority. It also

indicates that the correct factors have been given the emphasis required. The high investment levels, the management and development of personnel, and work practice in a changing technological culture require direction and support at the higher levels of organisation to gain the fullest benefits promised by technological implementations and innovations.

In the real-world situation, the implementation of these seemingly correct and authoritative objectives has not been as successful as this high-level planning and formal structuring might suggest. The real-world implementation, which is the most difficult task of any policy decision, has been characterised by a series of organisational changes. The extent of these changes indicates a lack of underlying stability at a high level within the MGOs and the creation of areas of overlapping responsibility in IT policy administration within the Federal Administration itself.

5.3.3 IT Policy at the National Level

The emphasis placed by government on IT planning and administration is apparent from the examination of organisational changes, which culminated in the establishment of the National Committee on Data Processing (NCDP) in 1985. The activities of NCDP are, however, constrained within the bounds of government policies, initiatives, and resource allocations. Although the Malaysian government has clearly recognised the potential benefits of an effective IT strategy, the government itself is faced by constraints in its choice of initiatives that can be realistically supported and in the general resource allocation in support of a wider range of government strategies.

The government's formal and informal attitudes towards IT strategies can be detected through an examination of the various public announcements and statements on IT policies which have been made by a number of Cabinet Ministers. The most

important of such statements was made during an international conference held in August 1988. Different aspects of these statements have been reiterated by various government authorities since that time. The conference held in 1988, entitled the "International Conference of Computerisation for Development - The Research Challenge," was an occasion when the PMD Minister encapsulated policy direction in three main areas.

The first policy statement related to the government's intentions to act as a catalyst in stimulating cohesive developments in both the public and private sectors. The emphasis would be placed on modernisation, competitiveness, efficiency and productivity. The second policy statement related to education. The intention was to equip every school in the country with its own systems and to promote IT literacy and skill development. Higher education institutions would have modern IT teaching courses and IT research facilities. The third policy statement related to the private sector. There would be a drive to promote a competitive IT industry capable of hardware design, development, and manufacture. Software designs and software production were to be encouraged. The objective was to promote private sector developments that could supply and support domestic markets, and could be adapted to the demands of international markets.

Subsequently, action plans were formulated in support of these policy statements. The plans included initiatives, adaptations of previous plans, changes in direction and levels of emphasis in different areas covering the development of personnel, IT standards and standards in telecommunications, regional co-operation, greater involvement of the MAMPU in co-ordinating activities, research and development, the setting up of the National Consultative Committee on IT (NCCIT), commercialisation of software, and new initiatives in the area of resource sharing.

Although comprehensive in nature, these plans were not designed to implement policy under tight central control. The objective was to prompt various agencies to question their role in the process of computerisation and modernisation.

A second objective was more direct and structured in nature. The aim was to establish formal consultative relationships between IT developers and end-users both in the public and private sectors. An emphasis was also placed on formal consultative relationships between IT interests at a senior level in central and other key agencies and within the universities, research institutions, professional bodies, and industry. Hopefully, by enhancing the general level of communication, common problems relating to IT could be identified along with possible solutions or defensive measures that could be taken over the medium and longer terms.

A third objective was even more specific in its application. The aim was to promote the development of software in the private sector. Tax and other incentives were to be awarded to promote and accelerate software developments in the private sector, with additional incentives for developments, which included high value-added components.

The NCCIT, formed in August 1988, was to include representatives from the private sector. The objectives of the NCCIT were to co-ordinate and integrate the efforts of the public and private sectors, and research institutions. Suggestions and recommendations could be forwarded to the NCDP, which could elevate policy issues to Cabinet level. The chairman of the NCCIT is the MAMPU Director-General with representatives from Malaysian Institute of Microelectronics Systems (MIMOS), Malaysian Associations of Computer Industry - PIKOM (representing the private sector), the Malaysian National Computer Confederation - MNCC (representing IT professionals), and representatives from all the universities. The NCCIT is concerned with co-operation between the public and private sectors in the establishment of joint R

& D centres, resource sharing, public and private sector human resource development, telecommunications developments, standards, IT promotion, and marketing.

However, in 1994 the secretariat of NCCIT was transferred to MIMOS, and the name was changed to the National Information Technology Council (NITC), with the Prime Minister as the chairman of the committee.

The emphasis of national IT policies indicates a recognition of the potential benefits of IT in support of national development, and government policies are directed towards IT promotions, co-operation, and consultation between the various high-level interest groups.

Although there is a strategic emphasis on IT development, and formal structures have been established to provide a technological focus on CBIS implementation, IT project successes are below expectation. The infrastructures that are intended to support this technological focus are culturally and politically focused. Unqualified and inexperienced staff might be promoted into key technical positions involving substantial responsibility in tactical decision-making and management of technical investments.

In order to analyse the processes of CBIS implementation in context, the next section uses Walsham's (1993) multilevel framework. This framework is appropriate to the analysis of social, cultural, and political aspects of change in complex organisational contexts.

Initially, the social relations between stakeholders were traced using web models. This enables the broader context to be examined by identifying the relationships that exist between the subcultures, and the types of relationships between subcultures that are required to meet organisational objectives. More specific

relationships were also examined involving key stakeholders that contribute or could make contributions to technological and social issues. An example is the relationships that exist between senior executives and IS practitioners. This first step in the analysis provided the social context within which technological development takes place.

The second step of the analysis involved study of the social processes that result from cultural and political perspectives of individual stakeholders and groups, and act towards maintaining the status-quo of the structures or cause change and evolutionary tendencies. The second step of the analysis also involved a study of the social processes that result from the exercise of control and domination, and is preconditioned by political perspectives.

The third and final step of the analysis involved the study of the linkage between social context and social processes. In this way, the interdependencies of context and structure could be examined for effect. In this part of the analysis structuration theory was used as a conceptual approach. Because large-scale CBIS implementation can have far reaching effects on work context and social processes, structuration theory provides an appropriate conceptual approach in determining what effect the technology is having on organisational and social structures, and vice-versa. Because the institutional realm and the realm of action configure each other (Barley, 1986, p. 79; Walsham & Han, 1991) structuring processes over time could be studied as effective or ineffective evolutionary tendencies and resource investments over time.

5.4 The Operating Agencies

5.4.1 Ministry of Land and Co-operatives Development (MLCD)

5.4.1.1 Background

The Ministry is headed by a Secretary-General. He is assisted by a Deputy Secretary-General and four Divisional Directors or Director-Generals, each responsible for specific functions, and by other senior officers as well as supporting staff.

The Ministry consists of one Department and four Divisions:

i) Administration and Finance Division
ii) Land Management and Legislation Division
iii) Policy and Development Division
iv) Land Information Systems Division.

The Department of Survey and Mapping has two Divisions:

a) Cadastral Survey Division
b) Mapping Division.

The Land Management and Legislation Division is headed by the Federal Lands Commissioner appointed under the Federal Lands Commissioner Act 1957 (Revised 1986). He is also known as the Director-General of Lands and Mines (KPTG) when carrying out the functions conferred upon him under the National Land Code 1965.

Formerly, this Division was known as the Federal Lands and Mines Department. However, when the various departments under the Ministry were

integrated into the Ministry in January 1982, this Department became a Division within the Ministry and was known as the Land Administration and Legislation Division. The term "Administration" was changed to "Management" in early 1988.

a) Mission and Objectives

The main objective of the MLCD is to contribute towards the goals of eradicating poverty, by:

i) creating policies on land development resources to ensure maximum utilisation of land; and
ii) uplifting the socio-economic standards of rural communities and specific urban populations through co-operative movements.

The objectives of the KPTG are:

- To formulate or review land legislation;
- To co-ordinate the operation of land administration; and,
- To promote a system of land management in accordance with modern management techniques to meet current development needs.

b) CBIS Projects

In 1983, the Malaysian government signalled its intention to standardise land registry procedures, work practices, ownership records, and the transfer of land-ownership titles. The intention was to create a Land Data Bank Unit that operated in a standard and regulated manner, and that could be used to monitor ownership, land transfers, land development and land revenue collections. In this way, the different aspects of land developments could be monitored including issues that related to

planning permission in the development of land resources, in order to provide planned cohesive land development projects throughout Malaysia. All Land Registry Offices throughout the country were expected to be computerised using bespoke software systems that reflected legislature requirements involved in land tenure, the transfer of title deeds, and the control of speculative development schemes.

In 1988, the MLCD appointed a Swedish consultancy firm to study the feasibility of creating a computerised Land Information System in Malaysia that could be used by all Land Registry Offices, and to make recommendations on proposals for its implementation. The system was to comprise two main modules, in line with the reporting requirements at the federal level and the recording activities at the state level. At the state level, the system was to include appropriate legislative and management subsystems, such as Land Registration, Temporary Occupation Licences (TOL), Land Inventory, and Land Revenue Administration and Collections routines.

Based on the recommendations made by the consultancy firm, a pilot project was undertaken to implement a Land Information System at the Land and Mines Office in Kuala Lumpur. This project was to involve the recording of more than 135,000 land title details onto the office's computer systems. The system itself became operational in 1993. At this point MLCD sought authorisation for the implementation of Computerised Land Registry Systems in the states of Kedah, Perlis, Terengganu, and Pahang.

During the implementation of the pilot project at the Federal Territory Land and Mines Office in Wilayah Persekutuan, Kuala Lumpur, projections were made for time scales for a national implementation of such a system. The targeted date for the pilot project was July 1994, at which time it was expected that all manual systems in all Land Registry Offices throughout the country would be computerised and fully operational. Although the technical and financial resources were available to meet this

objective, the target date for project completion has not been achieved, and a new target date has been set for the end of the year 2000.

The intention of senior executives in implementing a national computer-based Land Information System was to enable all planning activities related to land matters to be carried out more effectively. Transactions involved in the transfer of title deeds and the collection of land revenue could take place in shorter time scales, and could be accurately recorded, and policy decisions could be refined in line with the mission statement and objectives of the MLCD.

5.4.1.2 The Social Context

a) Historical/ Political Context

The Land Information System (LIS) Project was initiated by the Federal Government, which was trying to establish standardised procedures and practices for effectiveness and efficiency of government machinery. The project was implemented at the departmental level. Most of the officers in this department were sceptical about the project and were not convinced that the project would run smoothly and successfully. This was despite the fact that the directive to implement the project came from a very high level of decision-making machinery in the government. Immediately afterwards they faced difficulties in changing the law and dealing with state administration as the potential obstacle. A very high-ranking officer in the department commented,

> We were given the directive by the Cabinet to implement the computerised LIS in 1987. However, to implement this project is not a straightforward matter. It involves the National Land Code and the state jurisdiction. The land law has to be amended if necessary. It is a long process because it has to go through various administrative channels before it can go to the Parliament for approval. Further, our department does not have the jurisdiction over the state land

> offices. They report direct to the Chief Minister of the state through the State Secretary.

Office automation leading to mechanisation of most of the functions and a reduction in the power and authority of the departments and in the administration of land matters was one of the main psychological factors for the negative attitude of the officer. This fear was further strengthened following the changes of the functions of the department soon after the transfer of the IS function to the Ministry. This was confirmed by the IS manager of the department who was also transferred to the Ministry. The manager recalled his experience in the following statement:

> When the project was first initiated by the Cabinet, I was the head of the Computer unit in KPTG. However, when the DG of KPTG became the SG of the Ministry, he saw that the project of this size, involving various agencies at federal and state level, was difficult to handle by the KPTG alone. He then suggested the establishment of an IS division in the Ministry and the removal of the Computer Unit and the project from the KPTG to the Ministry. Of course, the middle management of the KPTG was not happy with a take-over bid by the Ministry, but they have accepted the decision because of the hierarchy and respect for their senior officer.

The computerisation of land administration involves political issues between state and federal agencies because traditionally land administration is a state matter. As one Ministry official admits, implementing projects was becoming difficult as there was a lack of co-operation between the state land offices and the KPTG. All the stakeholders were concerned to show their resistance in many different ways. This was evident in the comment made by the Head of the Planning and Management Unit (PMU) in the Ministry:

> This project has a long history. Since the Cabinet decision in 1987, we only managed to complete the pilot run involving only one land office in Wilayah Persekutuan, Kuala Lumpur (WPKL) in 1995. We have been communicating with the state government and KPTG about the implementation of this project to other states, but after the various meetings there is no follow-up from them or, if there is

> any follow-up, their requests are always different from what we proposed. For example, we suggested to have a centralised database in the state HQ but they preferred a decentralised database, which requires more equipment. We cannot fulfil this kind of requirement because our resources are also limited. That is why the project was delayed.

There was resistance from the operating agencies because the Ministry wanted to control their most valuable asset - "information" - that would be stored in the database in the Ministry. Realising the resistance from the participating agencies, the Ministry official later changed the strategy. This was confirmed by the following statement from the head of PMU:

> The extension of the LIS project, in which eventually all information on land matters will be available nationally for planning and business purposes, was called the National Land Information System (NALIS). Initially, there was no co-operation among the agencies involved, because no one agency at either state or federal level wanted to hand over control of its data to the Ministry. Eventually, we changed the strategy, making NALIS only an infrastructure that provides directories of information available at various agencies under the Ministry. The discussion is still going on and, so far, nine task-force meetings have taken place and the matter is still being discussed.

The state officers perceived that the Ministry's project of using state land offices as a means to achieve Ministry objectives, neglecting state land offices' objectives was the reason for the lack of co-operation from the state land offices. They felt that this project has not solved their immediate problems, as was expressed by the officer of the KPTG:

> What state land offices have in mind is how the system can improve their revenue collection and other business activities. They saw that the Ministry seemed to have a different priority with its LIS and NALIS projects. Back in 1987, we started the computerisation of the revenue collection system. However, owing to lack of funds and workforce, we could only manage to give the system to a few states. Some states even started on their own system of computerised revenue collection because of the slow progress of

> the system implementation. Obviously, this would create problems of interface between one system and another. Further, when the Ministry initiated the LIS system, it was initially to cater for a registration system, with a revenue collection system to be developed next. This would again give some states lower priority. According to the latest plan, only by the year 2000 will the project be completed in all the states. Some of the state governments felt that the project was not going to benefit them in the short term and seemed to work their own way out.

b) Social Relations

Personal interests in career rather than the project led to the belief that there was no sign of confidence whatsoever in the top management's capabilities. The middle managers were no different. Owing to this, the operational staff's work was based on experience rather than on following the procedures laid down by the National Land Code. This was mainly so because the officers were unable to guide them. Few dedicated officers expressed this as clearly as did the IS Division Head in MLCD:

> The problems with our top management (SG) are that these people never stayed long in one Ministry. After 2 or 3 years, they either transferred out on promotion or had retired from service. If the project were initiated by one SG, the successor would not seriously take on interest in the project because it was not his and he did not particularly want to get into trouble if it affected his promotion or upset his retirement plans. The Ministry is administered in a very personalised way and not in a professional way. They are general managers with only general administrative knowledge. If we have a SG with scientific knowledge, then he may perhaps promote or champion the CBIS project. The problem is the same with middle managers in this Ministry or in departments under it. They never settle down. There is not enough time for them to learn the tricks of the trade in the National Land Code and further guide the operational staff. As a result, we have different practices and procedures in the state land offices although we use the same National Land Code. This has made the task of the development team difficult.

The failure of an important government project such as this computerisation project was mainly due to the factor that the leadership's qualities were not up to the

mark. One fine example is that of a top manager who personalised the project in consideration of his own future career after retirement. An officer from the KPTG stated,

> When the Ministry took over our computer unit, the SG thought that we could not handle the job. He was so obsessed with the project and wanted to monitor it personally. If we were given enough resources, clear direction, and guidance we could then handle and implement the project successfully. He seems to have personalised the project to himself.

The very bad example set by top management has led to resistance involving the morale and motivation of the respective staff from those agencies concerned. The IS project's team did not get any co-operation from the stakeholders concerned and they had to rely only on government decisions. The project manager expressed his frustration knowing fully well that this kind of project cannot be tackled at the project-team level. He stated,

> A project team has been set up to handle the pilot project in WPKL. The members include a land administrator and an officer seconded from the Policy Unit of the KPTG. Initially, we had the problem of legal interpretation. The KPTG is the agency entrusted with issues that are related to the legal matters of the NLC. They should be the expert in this area and act as an adviser to various state land offices. However, the officer in-charge of the Training Unit in the KPTG was not represented in the project team. We saw this as a form of resistance put up by KPTG management. They often say procedures are not to be changed, because of legal implications, and warn that we may lose if people challenge us in court. Because of these obstacles, the IS division in the Ministry, with the help of the Swedish consultant, has taken the initiative to propose the amendment of the NLC and finally the project teams were only managed to automate the existing procedures. We could have done more by restructuring the business process if the issues of legality had not been brought up or handled seriously by the KPTG.

In practice, the main problems are not of technology but of people, as was clearly stated by the project team. The top management assumed that the project team

knew what to do as they were technically trained. Their assumption was that the implementation of the CBIS project was as simple as mechanising procedures. The project team further commented that

> Originally, we were in the dark. Besides the Cabinet decision, there was nothing to guide us on how to go about developing the system. Later, in 1989, consultants were appointed and they eventually guided us on the project. There were problems from the user side also, because they did not know what to expect and could not see the immediate benefit that can be derived from CBIS and their management did not take the trouble to explain the objectives and actual benefit of the system. When we started the parallel run, in the WPKL land office, the operational staff saw it as an additional work for them and did not fully support it. Now, we can see their attitude changes when they see the benefit derived from the system.

Finally, within the social relations context, CBIS were seen as an act of one agency trying to dominate over the other agencies. This is obvious from the attitude taken by senior executives in the Ministry towards KPTG and state administration. Besides unclear signals and lack of effort from top management in the Ministry to support the project, the leadership agenda of the top management was not acceptable to the officers at the department and state levels. Therefore, it can be clearly seen that various forms of either direct or indirect resistance emerged against the project.

c) Infrastructure

Special agencies are the competent ones to handle this project, as is felt by the Head of the IS Division, but this message does not seem to get across via the right channels to the appropriate people. The IS division feels the need for a skilled leader to lead and motivate, and for a knowledgeable manager to manage the projects. This is where the organisational set-up for the project went wrong, so that the IS Head in MLCD commented,

> The top management thinks that with the Cabinet decision, they do not have to do anything and it is up to the division to survive or sink with the project. They assume that everybody understood and knew what to do. Accountability and responsibility were delegated to the IS division. They know that it is a problem dealing with various state agencies and departments, and they conveniently try to avoid confrontation with these agencies. After all, they are not the ones who initiated the project. We need top managers who have scientific knowledge; merely having general administrative knowledge is not enough. That is why this project must be handled by special agencies with professional people who have the expertise in relevant fields such as land matters and IT, right from the top. The expertise can then be built up rather than being drained out like in government agencies.

The project team leader had similar views and commented on the poor quality of leadership he had observed in his experience so far. The comment of the SDU Manager in MLCD was:

> The top management doesn't give us the moral support and vision. New SGs always come with new agenda of their own, so that the continuity of a project is always at stake.

Clearly, the senior executives in the Ministry did not make any effort, or any significant contribution, nor did they give direction either morally or physically to push forward the CBIS project. They did not encourage the "take your time" attitude but they indirectly admitted that the IT agenda was not part of the Ministry's corporate mission. This reflects the resistant attitude towards technology. Senior executives further accepted the slow process involved in technology acceptance as it involves exposure and training. They stressed the importance of management skills and the non-essential need to focus and rely too much on technology. These attitudes did not contribute towards increasing IS practitioners' working morale. One of the top management in MLCD commented on the use of IT in his Ministry,

> We must update ourselves with new technology. However, IT is not an end. Not all jobs need automation. IT is only a tool. Management skills must be there and the user must also be knowledgeable. We are in the

> transition period and must give a few more years to adapting ourselves to the new technology environment. Although we do not have IT established in our corporate mission, this Ministry is quite advanced in using technology.

There are also problems at the operational level of land administration. Most of the land administrators are not familiar with the land law. Therefore, there is a lack of professional guidance from the Land Administrator towards operational staff and the project team.

Utter confusion leading to chaos arises mainly because officers working in land administration matters have had a short tenure and differ in their prioritisation of work. This has them into a position where they have become highly incompetent in understanding the capabilities of technology and lack knowledge in this field. The IS Division Head further stated that

> Land administration in this country is in a messy state. Different states are using different practices and procedures even though they are using the same NLC. Most of the District Officers use their own interpretation of the law, because of their unfamiliarity with the law and because there is no expert to refer to. We don't have professional land administrators because there is not enough time for them to become experts. Just after 2 or 3 years in the land office, they will be transferred to some other places, bringing along with them whatever knowledge they have gained during their tenure of the office. As a result, some operational staff resort to old practices and habits in administering land matters.

Investigation into the social context of the CBIS project in the MLCD has revealed several themes, which are summarised in the following table:

Table 5.2: Some Elements of Social Context in MLCD

Historical/ Political Context
• The Land Information System (LIS) Project was initiated by the Federal Government, which was trying to establish standardised procedures and practices for effectiveness and efficiency in government machinery • Land administration, however, is a state matter and therefore involves political issues between state and federal agencies
Social Relations
• Characterised by personalities of top managers in the Ministry • The IS Division in the Ministry is merely using government decisions to carry out its function • CBIS were seen as an act of one agency trying to dominate over the other agencies
Infrastructure
• No significant contribution or direction from the top management to push along the CBIS project • Lack of professional guidance from the Land Administrator towards operational staff and project team

5.4.1.3 The Social Process

In the context of culture in the organisation, it can be clearly seen that there are no common objectives among the stakeholders as far as the CBIS project is concerned. The project team's concern for the technical specification of the equipment and IS requirements, in contrast to the top management's only concern of how much money is being spent on gadgets and equipment following delivery and installation. The end-users, on the contrary, are interested in minimising work rather than learning and understanding the technology. A common assumption of those involved in the project is that the project's implementation is rather a technical issue, so that they ignore other

key factors such as organisational culture and behaviour. One officer from the Ministry commented that, so far, this project has had no impact on the various stakeholders, especially the government:

> The way LIS was implemented brings no impact either to the user or government. It took eight years to implement the project in just one state. There was no strategy to handle various stakeholders in the project. The project team looks only at technical suitability and using the Cabinet authority to force its way through.

The incompatible perspectives of subcultures of state land offices and the KPTG during the development process further emerged in the form of conflict. The conflict between the departments had further heightened owing to the following reasons. As is very obvious, the objectives of each department differ one from another. To be more specific, the officers in the Ministry did not have the power under the law and it was only the officer in the KPTG who had the power. They were in the Ministry as a policy-making body and not as an implementing agency. On the other hand the officers in the KPTG felt that the Ministry had overruled their function and they retaliated by not giving their full co-operation to the project team. An officer from the KPTG commented,

> This is originally our project, but the Ministry took it over from us. Further, they overruled our view on legal matters. Now they should tell us what is our role in the project. State land offices look to the KPTG for advice rather than to the Ministry. Obviously, the state land offices have a different priority (revenue collection) from the Ministry (registration system).

Even though the top managers in the KPTG was well aware of the problems faced by their officers, they were not taken into consideration but were dismissed as non-serious matters. The department (KPTG), on the other hand, appeared to have two groups, one that belonged to the above-mentioned dissatisfied group which was not pleased with the way the project was implemented, and the second group

comprising those who belonged to the top management of the KPTG. This latter group liked to play it safe at all times because of their own personal interests (normally the head of the department is the successor to the Ministry's SG post). One of the project team member commented that:

> The KPTG's function is to improve the land administration system and it is not the IS Division's function in the MLCD. Unfortunately, top management in the KPTG did not take any initiative to clarify and remedy the situation.

It can be seen from the various statements made by the stakeholders that the top managers in the Ministry are unaware of the need to influence cultural change in the implementation of the project. They did not provide any form of motivation or significant contribution towards the direction of the CBIS project. Neither was there any knowledgeable leader who could motivate or an appropriate manager who could manage the projects. The IS Division, on the other hand, suggested the need for special agencies to handle the projects, but the message does not appear to have got through.

In the political context, so far the project appears to have the following characteristics: there are conflicting views among stakeholders; they are fighting over the control of important "information" resources on land matters; and most of the officers are suspicious of their leadership agenda. The main players who seem to contribute to the conflict are the officers in the KPTG, as their resistance has resulted in no effective participation by them during the development process.

On the other hand, top management showed a lack of vision and direction towards the monitoring and control of the project's implementation. There is no political will in the top management to interfere and contribute towards the cultural change required by the project. This is evident from the top managers' unwillingness to

participate and their distancing themselves during the implementation process, arguing that the project is too technical for them to interfere in it.

The themes that emerged from the social process of CBIS implementation in the MLCD are summarised as follows:

Table 5.3: Some Elements of Social Process in MLCD

Cultural Perspective
• Decision to computerise LIS made by the Cabinet, with Ministry seeing its role as technical implementation • Incompatible perspectives of subcultures of state land offices and KPTG during development process • Top management in the Ministry unaware of need to influence cultural change
Political Perspective
• Resistance from KPTG resulted in no effective participation during development process • Top management showed lack of vision and direction towards the monitoring and control of the project's implementation

5.4.1.4 The Context /Process Linkage

a) Strategy and Leadership

The SG drew on facilities to allocate resources in the Ministry to initiate the LIS project. He legitimated his action by appeal to the norms of planning activities related to land matters that can be carried out more effectively, so that the collection of land revenue and any form of transaction pertaining to land matters will be completed within a shorter time.

The structure of signification in MLCD was reflected by its viewing on project co-ordination as best achieved through direct control from the Ministry and the structure of domination inherent in the top-down relationship and autocratic leadership.

The intended strategy for implementing CBIS was for better project co-ordination and monitoring, but unintended consequences included resistance from the KPTG and state land offices. The KPTG legitimated its action by not actively participating in the system development process

b) Implementation Process

The signification structure of CBIS as tools for restructuring business processes was not subscribed to by the KPTG and state land offices. Even though an attempt to co-ordinate agencies' participation was not very successful, the IS Division in the Ministry eventually exercised its power by drawing an interpretative scheme of Cabinet decisions, thereby attempting to legitimate a new system by suggesting amendments to the law with the help of a consultant and overruling the KPTG's decisions.

c) Implementation Status

Existing social structures were largely reproduced as each agency tried to strengthen its position and bargaining power. No action was taken by the top management to create shared structures of meaning. The extension of the LIS project to NALIS did not seem to consider the need to change social structures or modify the structure of signification in order to enable communication or bring together of the different subcultures.

Table 5.4: Some Elements of Context/ Process Linkage in MLCD

Stage 1: Strategy & Leadership
• SG drew on facility to allocate resources in Ministry to initiate LIS project • The reflected structure of signification viewing project co-ordination as best achieved through direct control from the Ministry • Intended strategy was better project co-ordination and monitoring, but unintended consequences included resistance from the KPTG and state land offices
Stage 2: Implementation Process
• Signification structure of CBIS as tools for restructuring business processes • Attempts to co-ordinate various agencies' participation were not very successful, and IS Division eventually exercised its power by drawing an interpretative scheme of Cabinet decisions
Stage 3: Implementation Status
• Existing social structures were largely reproduced • No action taken by the top management to create shared structures of meaning; former SG was personally monitoring the project, but the later SG then left it to the capability of IS Division alone

5.4.1.5 Conclusion

In the MLCD, it was found that the CBIS project failed to narrow the gap between conflicting views among the agencies and there was a lack of awareness of the need to resolve the conflicting views. It has no experienced staff to investigate and integrate management and user requirements, and to deliver the projects in time.

However, CBIS eventually contributed to speeding up processing, reducing the workforce, and to better security control over the documents, but they exceeded the implementation period (8 years longer than the original time).

5.4.2 Immigration Department (ID)

5.4.2.1 Background

The Immigration Department was established in 1946 after World War Two. Before this period, the functions of the Department were assigned to a few government agencies (i.e. Police, Labour and Chinese Protectorates Department), which were distributed all over Malaya (as the country was then called). During this period, all the states of Malaya had their own immigration and passport laws. After World War Two, the government established a bureau known as the Refugees and Displaced Persons Bureau and Immigration Department to manage the activities of refugees and deport illegal immigrants back to their countries of origin.

When Malaysia achieved her independence, a set of regulations and acts was established to provide the Department with guidelines on guarding the security of the country. The Department's guidelines are presently based on the Immigration Act, 1959/ 1963 (Act 155) and the Regulations and Orders and Passport Act, 1966 (Act 150).

The Department is headed by a Director-General. He is assisted by a Deputy Director-General and 6 Divisional Directors, each responsible for specific functions, and by other senior officers as well as supporting staff.

a) Mission and Objectives

The functions of the ID include safeguarding peace and national security, controlling and regulating the inflow of foreigners into the country, and issuing official travel documents or passports to Malaysian citizens and residents wishing to travel abroad.

The mission of the department is to provide quality service to the public and to retain and safeguard the privileges and harmony of the Malaysian citizens.

The objectives of the departments are:

- to provide efficient and effective service in the issuance of passports and travel documents;
- to facilitate immigration services provided to visitors to Malaysia;
- to obstruct the unlawful entry and presence of prohibited immigrants or visitors who do not comply with the immigration and passport regulations, hence safeguarding the citizens of Malaysia and preserving the security of the country; and
- to detect and stamp out any unlawful actions which are not in compliance with the Immigration and Passport laws.

b) CBIS Projects

The ID's computerisation project started in June 1983, with the installation of a Honeywell Mini at the Subang International Airport for the Suspect List Checking. In 1986, the government suggested that the use of computers should be expanded to all Immigration State Offices and Immigration Control Posts. It was then suggested that the computerisation project be a turn-key project, the tender for which was won by a private contractor. The project was however unsuccessful, which led MAMPU to decide in 1989 to purchase the necessary equipment to allow the department's computer personnel to proceed with the computerisation on their own.

Computerisation of the ID was not only intended to equip the department with tools of management but also to ensure the availability of up-to-date information to

enable the department to improve its checking and enforcement activities. Three applications that have been identified for implementation are the Identification System, the Black List System, and the Passport System.

Computerisation should help the ID to carry out its functions with greater effectiveness. For example, the Black List System has speeded up the checking process against black-listed names in the processing of applications for international passports and permits for entrance/ exit into and out of Malaysia.

In 1992, the ID introduced the computerised Machine Readable Card (MRC) to replace the cards and manual passes which were previously in use. These cards, which contain personal information about their holders, conform to internationally recognised standard features and are also equipped with high-quality security features. The main reason for using MRC cards/ passes is to prevent the kind of abuse and fraudulent activities which might have occurred under the previous manual methods. Through a computerised system located at all the entry/ exit points in the country, the particulars of holders contained in these cards can be immediately retrieved and displayed for easy verification.

By the end 1993, 46 immigration offices/ posts throughout the country had been linked with the headquarters. These immigration offices/ posts were henceforth able to use the system facilities located at headquarters 24 hours daily. Expected benefits derived from the data communication network include:

i) access to integrated, up-to-date and precise information by all immigration offices/ posts throughout the country for daily operations;
ii) tracing of discrepancies in applications for international passports at any immigration office/ post in Peninsular Malaysia;
iii) compilation of up-to-date statistics for management; and

iv) prevention of delays and reduction in workload at the data-entry centre at headquarters by means of data transfers for the Tracking System (information from IMM26 card) through the communications network.

Currently, the ID is in the process of networking all its state and district offices in Peninsular Malaysia, Sabah, and Sarawak. The establishment of such a nation-wide network, which will allow central control and monitoring, will ensure that information available in the computer system will be more current and accurate, and also highly reliable.

5.4.2.2 The Social Context

a) Historical/ Political Context

The main problem faced by government agencies dealings with the public is that too many people require the services for the limited number of staff to handle their customers' needs. Although automation may appear to be the answer to all these problems, it cannot solve the problems overnight. The top managers' thinking, either in the central agencies or in the operating agencies, is that by computerising the activities the problem can be solved immediately; they are therefore unwilling to allow any increase in the number of operational staff to handle the project. This has angered most of the operational staff. Their feeling is that with computerisation, not only is there too great a workload but also not enough personnel to handle it. Different Immigration Officers (the operational staff) made the following comments:

> Computerisation has increased our workload. Instead of doing our own job, which is already huge, we have to key in the same data into a computer.

> We don't see how the computer can help us in reducing the day-to-day workload. The system only helps or satisfies the top management.
>
> With computerisation we should not handle files any more, but we have to both handle files and key-in data.
>
> In one of the states, there are more terminals than staff.

However, in an attempt to work with the limited number of staff available, IS practitioners have suggested a computerised system that avoids doing the same work twice, i. e. by direct data-entry into the system. But obviously, since there is no track record of any computerised systems that has worked smoothly in the past, the attitudes of the operational managers are predictable. The DP manager expressed his concern in the following comment:

> We want to introduce an on-line system in which data can be directly keyed into the computer with slight changes in the work procedures, but the Head of Division still wants to use the old procedure of processing applications manually at the counter and then keying in the data at the end of the day. By doing this, he doubles the workload and of course there are not enough staff to handle it.

The DP manager felt that the attitudes showed by some of the operational managers within the division or states defeated the purpose of computerisation. The reason for introducing computerisation in the department was, according to him, the high volume of data processed by the department. He also argued that automation alone cannot solve the department's problems without changing the way employees do their work.

However, the DG of the department seems to have arrived at different perceptions of computerisation from the reactions of his operational managers and staff. His thinking is that computerisation should solve the major problem in the department, i.e. reduce the day-to-day workload by speeding up processing and

eventually reducing the number of staff. It ought also to provide, he believes better security control of documents issued by the department. His perception of computerisation was revealed in his following comment that

> Computerisation should help speed up processing of applications, and provide better security control and reduced staff.

Among the officers and operational staff of the department, including the DP division there are signs of frustration and dissatisfaction with the top management. They feel that the department is always being used by the senior executives as a stepping-stone for administrators to get promotion or recognition at the expense of any new project like the CBIS project. One of the key IS practitioners admitted that he and most of the operational staff and IS personnel of the department were at a very low ebb in their working morale:

> On average, officers and directors are transferred out of the department within two years. They stay very short, so that there is nothing much they can do, nor can they gain an appreciation of the operational problems within that short period. When a new director/ officer comes, he always changes the system requirements.
>
> But some officers stay too long (over twelve years). There is no motivation for these officers, so they don't do their work seriously or guide their staff properly. They just don't care.

This key IS practitioner's remark was confirmed by one of the Immigration Officer interviewed, who stated,

> Our DG and Directors always stay for a short while. They don't have enough time to learn about the business of the department. As a result many problems that require a policy decision are not settled. We are very disappointed.
>
> A new DG always brings new ideas. This adds to the already heavy workload we have. Normally, we do not respond to new ideas immediately, because the DG would not stay that long. They always

> get their promotion when those ideas are being recognised by the government. What do we get?

Further investigation revealed that this department not only suffers from a shortage of operational staff but also from a lack of experienced IS personnel and funds. The fact that PSD, one of the central agencies that control the placement of IS personnel, has made the DP division in the department does not mean that it is in any position to commit the delivery of any CBIS project to the users. Besides, interference from top management does not always help speed up projects but, more often, contributes towards delaying them. One of the key IS practitioners spelled out his opinion as follows:

> Users' expectation is very high. They want everything on-line. This kind of system needs immense amounts of investment and time to develop it. We don't have the budget and experienced personnel to do the job. If we had the budget, the tender procedures would always be time-consuming and sometimes there would be interference from outsiders who are using political connections to win the tender. I had to cancel one tender because of a complaint from the vendor to the DG, accusing the evaluation committee of malpractice. I finally arranged for approval by the Treasury to get a direct negotiation with the previous vendor.

One of the project leaders in the department expressed a similar view when he said,

> I have to supervise too many people. I am the only systems analyst (SA) with eight years' experience. The others have been working for only two or three years. They are lacking in experience and skills, especially when trying to gather information from the users. Sometimes, they have to supervise a programmer who is older than themselves. There are always conflicts between them.

During this study, there was a new development related to the CBIS project in the department in which a project consultant was called in to handle the project in total. Tired of having to handle the project in a piecemeal fashion and of having to face

stakeholders' scepticism towards the project alone, without any clear support from the top management, the DP manager convinced various authorities to privatise the CBIS project. After many years' working in the department, he expressed the following conclusion during the interview:

> For this department to get an impact from computerisation, what is needed is a total change in work procedures by having an on-line system for the staff working at the counter, because they are at the front end and have direct contact with the customers. That is why PNB[16] was invited to provide the total solution.

b) Social Relations

There seems to be no team effort in the department. The DG himself did not promote any team work among the managers, but preferred to work by himself. This has resulted in confusion and suspicion among the managers and the staff. This scenario has made the IS practitioner's task more difficult since whatever instructions are given to the DP division by the DG on any project related to the operational division, they are not conveyed by him officially but only through the DP division, which has no authority over the operational division. The DP manager made the following comments on this situation:

> DG always calls DP people direct when he wants us to develop a system or if he has some ideas about the system. Normally, these SAs will report to me when they receive such instructions from the DG. I will then assign a DP team to carry out a feasibility study and eventually develop the system. Unfortunately, the DG does not convey his ideas or projects that he has initiated, through us to the operational division. Sometimes the DDG is also unaware of such a project, unless I brief him. As a result, when our team is trying to gather facts for the system, the operational division is always suspicious of what we are trying to do and sometimes shows resistance towards us by not giving enough information. Therefore, when the system is ready for the users, they refuse to use it, with

[16] PNB stands for Permodalan Nasional Berhad, the local CBIS project consultant who undertook the implementation of the CBIS project in the Road Transport Department.

> the excuse that there is no directive from the management. Only through the good relationships that I have established with some of the heads of the division have I been able to encourage them to accept the system. They always comment to us that this system is not for the user but for the DP division.

One of the senior IS personnel confirmed the DP manager's statements in the following remarks:

> The DDG, being the chairman of the computer steering committee, is in an awkward position because the DG always by-passes him and the committee by talking directly to DP staff. Showing his frustration indirectly, he then dissolved the steering committee. Now things are difficult for the DP people. Middle managers don't understand the computerisation programme's direction! Operational users don't want the system!

Because of the poor leadership example in the department, people are suspicious of each other and there are conflicts everywhere. One of the key IS practitioners, for instance, made the following statement:

> There are two teams in this department. One group associates itself with team A, the other with team B. Of course, the groups were not obvious to the staff, but among us, we know who is in what camp! However, I am trying to be neutral. If one of them calls me for some assignment, I will make an effort to brief the other one afterwards and vice versa. It is a delicate situation and has created mistrust among some of the heads of the division.

He also admitted that there existed conflict between the DP division and the Employment Pass & Foreign Labour (EPFL) division:

> We have been accused of trying to increase our empire by taking over their functions. In order for the system to be implemented, we are actually helping them with their workload by keying in the data and processing the MRC cards. When we hand over the system to them, they sabotage the system by delaying the updating of data, thereby making the statistics produced by the system outdated and useless!

Without denying that there really exists a conflict between the divisions, one of the Immigration Officers in the EPFL division made the following remarks:

> This system is not for us; it is for the computer division. They are the ones who determine the requirements, not us. The production of MRC is our function. We are the ones who process and approve, but when the data goes into the computer, the system rejects it! The DP division creates its own enforcement to check on us. Now, they hand over the system and the production of MRC to us, but the statistics are only for production purposes; management cannot use them. Some of the information is incorrect and irrelevant to us.
>
> DP people seldom discuss with us the system requirements. What we want is different from what the system gives us.

There seems to be conflict also among the DP staff. The Operation Unit and the Development Unit also blame each other where possible when projects fail to meet the target date or users' expectations. One of the SA in the Development Unit made the following remarks:

> We work very hard to develop the system. When the system is ready, the hardware is not ready. The user has lost faith in us. We promise them the system but we cannot deliver it on time because of the hardware constraint. We don't have monthly meetings in this division, so there is no formal channel to discuss our problems within the division. The operation section never consulted us when they wanted to call for tenders on new or upgraded equipment. One day, only by chance, I looked at a tender specification on the table of the SA operation and found out that most of our hardware requirements were not included. The reason given was that they had not been informed by the manager, but I had put up the requirements to the manager a long time ago.

The SAs in the Operation Unit also have their own argument. Unfortunately, owing to unknown reasons, there is a clear division of gender between the Operation and Development Units for staff allocation. The Development Unit is mainly staffed by the

female SAs and programmers, and the Operation Unit is mainly staffed by the male SAs. One of the SA in Operation Unit commented,

> The development team consists of mainly female staff members who are conscious of traditional role sets involving reserve and precedence. The users perceive the Development Unit SAs as lacking in friendliness and communication, and difficult to approach.

Besides problems in the DP Division, there are also problem of non-involvement from the Operational Division. This is mainly due to the frequent changes of the heads of divisions. The heads normally avoid any commitment by delegating the task of identifying their divisions' CBIS requirements to the lower-grade staff, knowing that they themselves are not going to stay long. The situation becomes worse when the commitment made by the staff as far as their division's CBIS requirements are concerned is often not recognised by their managers. This has made the task of the CBIS development team useless. One of the SAs in the development team commented,

> The requirements always change when the new Directors come in. They do not listen to their operational staff's advice or complaints. They seldom bring up problems related to their division to the top management.

The non-commitment of the Operational Division heads was also commented on by the DP manager:

> These heads of divisions are so engrossed in operational functions and the power that comes with the title that they do not have time to engage in planning or automation for their division. In 1992, we implemented the Foreign Labour System, but the procedures only came out one year later.

However, the Head of the Security Division (SD) seemed to support the computerisation of the department. During the interview, he clearly stated how he could benefit from the CBIS project if the other divisions supported it:

> The head of division must show a sense of ownership over the data by stressing the need to update the data as soon as possible. This is important for security purposes.

c) Infrastructure

Poor leadership will also contribute to poor management co-ordination. The situation was made worse when the computer steering committee and project board was dissolved owing to personal conflict among the top management. One of the SAs confirmed the situation in the following remarks:

> The DG is a member of the computer main committee in the Ministry, but the DDG is not. However, recently, the DDG was appointed as the chairman of the computer steering committee at the departmental level, in consequence of which there is no link between the main committee and the steering committee. How are the decisions between the Ministry and the department to be co-ordinated?

Lack of team spirit has also led to poor co-ordination among the divisions in the department. For instance, the DP Division frequently complains that the Operational Division always sends lower-ranking officers or different persons for every project briefing at the state level. This has created inconsistencies and led to the inability of the officer to contribute towards system development work. The middle manager does not seem to bother or care about the CBIS project.

There are also weak monitoring systems in the department. There were a few occasions where the DP Division has delivered and installed the system in the operational department but the official procedures and operational guidelines for the

system were not ready. Normally, these procedures would be prepared by the Policy Research and Training (PRT) Division. The DG and DDG were not able to monitor the CBIS performance and co-ordination between the DP Division and the Policy Research and Training Division.

As has been discussed earlier, there are inadequate numbers of skilled or experienced personnel in the CBIS project team. There are too many female SAs and programmers in the development team with only two or three years' working experience. This situation has made the analysis and design work incomplete because of the cultural characteristics of the country, where female officers are always reluctant to venture into operational department activities either by observing or interviewing operational staff, especially the male officers.

The investigation into the social context of the CBIS project in the ID reveals many themes, which are summarised in the following table:

Table 5.5: Some Elements of Social Context in ID

Historical/ Political Context
• low morale of workforce • not enough investment in equipment/ training for computerisation • too much workload but not enough personnel to handle it
Social Relations
• DG uses his position to influence decisions made at lower levels • conflict among managers • conflict between DP Division and Employment Pass & Foreign Labour Division • conflict between Operation and Development in DP Division • Head of Operational Division not significantly involved
Infrastructure
• poor management co-ordination (e.g. computer steering committee and project board dissolved) • poor co-ordination among the Divisions • weak monitoring system (e.g. Policy Research and Training Division) • inadequate skills/ experience in DP project team

5.4.2.3 The Social Process

In the context of cultural perspective, it is obvious that in this department there are conflicts among the stakeholders. The conflicts involve people within their own division, between the divisions, and among the top management. The conflicts reflect the emerging culture of mistrust among the officers and staff, and the differing views between divisions (e.g. DP, PRT, & EPFL). The leaders' failure to promote team work in the department is also blameable, adding insult to injury.

The management in the ID is also insufficiently aware of the need to influence cultural change. This is similar to the issue raised in the MLCD case study. No effort is made by the management to explain to the staff the objectives and purpose of CBIS in their own language or in terms that are acceptable and can be understood by the operational staff. In these instances, it is not what the management says but who says it that carries impact.

In the political context, again the fighting over the control of resources emerged. There is clear evidence that open conflict had occurred between the DP Division and EPFL Division regarding control in the MRC processing.

The top management of the department, on the other hand, showed lack of capability in managing co-ordination and performance. Many conflicts among the heads of divisions were not resolved but instead there existed two camps of top management. The performance of divisions was not monitored; e.g. in the failure of the PRT Division to come out with the operating procedures.

The themes that have emerged from the social process in the ID are summarised as follows:

Table 5.6: Some Elements of Social Process in ID

Cultural Perspective
• mistrust and differing views between divisions (DP, PRT, & EPFL) • management insufficiently aware of the need to influence cultural change
Political Perspective
• open conflict occurred regarding control in the MRC processing • management showed lack of capability in managing co-ordination and performance

5.4.2.4 The Context/ Process Linkage

a) Stage 1: Strategy and leadership

The CBIS project was originated by the DG and the DP Division. In an attempt to legitimate their proposal for change, the top management, first, appealed to the norms of efficient customer service, taking up the complaints from the general public of poor services provided by the department (e.g. the customer has to queue at 5 a.m. and wait for ages to obtain approval or documents such as passports and employment passes for foreigners.); and, second, sought to ensure the availability of up-to-date, accurate, and highly reliable information to enable the department to improve its checking and enforcement activities.

The initiation of the proposal and the ability to push it forward derived from the top managers' perceived power to act, a perception which arose from the structure of domination inherent in the management/ staff bureaucratic and autocratic relationships. However, the primary purpose of computerisation was to alter the structure of domination by enabling managers to exercise control over the workforce, reduce

employees' indispensability, and keep track of activities so that malpractice could be detected.

The DP Division, on the other hand exerted power over other divisions. This exercise of power by the DP Division reflects the structure of domination seen in its pushing through the computerisation project. Not only did the DP Division decide the priority of application to be developed for the Division, but it also took over some of the functions of the EFPL Division in the processing of MRC. Staff in the DP Division sought to justify their action by appealing to the norm of the "tracking system" ready for immediate use by the Tourist Development Corporation (TDC), which originally provided the budget for computerisation (for tracking the arrival and departure of tourists, as instructed by the Government/ Prime Minister). It was claimed that this system offered a means of reducing the workload in the EPFL Division by speedier processing of MRC.

The Operational Division, like the EPFL & PRT, stuck to norms of division autonomy, arguing that the DP should not decide for them. Staff in the Division pursued this policy themselves by not supporting or using the system, not fully informing of its operating procedures, and not assigning knowledgeable staff during either systems development or implementation. Following the interpretative scheme, they used the Immigration Act and the legal authority of the Immigration Officer to overrule any computerised procedures. Their structure of signification was that CBIS are only for data storage and retrieval, and not for processing applications.

Through the structure of domination, the PRT Division showed its power by not producing operating procedures for the new computerised system on time, and it misled the DP system development effort by not giving complete information on existing working procedures.

b) Stage 2: Implementation Process

During project implementation, the project team's interpretative scheme was concerned with the nature or purpose of CBIS as tools for automation and control. In trying to obtain co-operation and involvement of the staff, they could not justify the above structure of signification, which was certainly not subscribed to by the operational staff.

In an attempt to legitimate the new system, the project team made an effort to study the procedure and Immigration Act, but there was evidently a need for experienced staff to interpret the legal requirements. However, the task of the project team was impossible since there is no genuine communication based on a shared structure of signification and common norms among the Divisions.

The project team sought to use the power of senior management, but was unsuccessful because senior management's structure of signification and legitimation

- viewed system development as a technical exercise;
- did not consider social, cultural, and organisational aspects (did not support the development team by explaining to operational staff in their own language the objectives and importance of CBIS in the department); and
- failed to use the power of their "right to manage" to bring together different subcultures and influence the structure of signification to achieve a common purpose concerning the CBIS project.

c) Stage 3: Implementation Status

Similar to the case of the MLCD, the existing structure of signification, domination, and legitimation in the ID was largely reproduced rather than being

changed in any fundamental way. No serious effort comes from the management to change the structure.

The user resistance provided the opportunity for vigorous social action and changed social structures by initiating new and enhancing existing activities. The original legitimation for the project was evidently not achieved. The DP manager saw the opportunity to change the structure when the PNB (the project consultants) offered their services after having successfully installed and implemented the CBIS project in the Road Transport Department.

However, the new and enhanced CBIS project should look first, into modifying the structures of signification - to see them as involving significant changes in work style and philosophy rather than as a simple automating of existing procedures; and, second, into the possibility of enabling communications and bringing together the different subcultures to create new and shared structures of signification.

Table 5.7: Some Elements of Context/ Process Linkage in ID

Stage 1: Strategy and Leadership
• Legitimation of need for new system by norms of efficient customer service and improving its checking and enforcement activities • Primary purpose for senior management was to exercise control, reduce indispensability, and track malpractice of the staff
Stage 2: Implementation Process
• Signification structure of CBIS as tools for automation and management control • Users were not asked to participate but merely consulted • Senior management sees it as technical exercise and assumes it is a problem of technical expertise rather than a social or cultural matter
Stage 3: Implementation Status
• Stages 1 and 2 largely reproduced existing social structures • Various attempts to sabotage the system, resulting in changed action/ structures • At this stage management should actively intervene to attempt to create shared structures of meaning

5.4.2.5 Conclusion

In the ID, IS practitioners fail to contribute towards narrowing the gap between conflicting views in the division. They are also unaware of the need to resolve the conflicting views, are unaware of any available methodology, and have no experienced staff to investigate and integrate management's and user's requirements.

The DP division also fails to deliver projects on time, is unable to co-ordinate hardware and software delivery, and is further unable to co-ordinate CBIS

implementation and procedures. Further, there is no indication that the workload has been reduced. The CBIS project seems unable to deliver total impact but only isolated parallel impacts with most of the work procedures being mechanised rather that revised.

However, in the ID, as appears through data gathered during interviews and field observations, CBIS seem unable to contribute to speeding up processing and reducing the workforce, although they do manage to increase security control over some documents and information.

5.3 Chapter Summary

The concept of web models was used as a way of tracing the social context of a CBIS. Elements of this approach were identified as the social relations between participants, social infrastructure, and the history of previous commitments. Besides web models, the importance of broader contexts was emphasised, within both the social and behavioural contexts of the individual, including such aspects as the leaders' roles and their worldviews. The discussion of social context and the analysis is organised under the headings of history, social relations, and infrastructure. The social process involves cultural and political perspectives on the process of organisational change associated with the CBIS. In the context/ process linkage, the formal model of structuration theory is used to describe the way in which context and processes are inextricably interlinked, and structuring processes take place over time in which social action, influencing social structure, reinforces or modifies that structure.

The impact of the Malaysian government's CBIS policies has been explored in this chapter. It is argued that the effectiveness of those policies indirectly affects the operating agencies' capabilities to perform in the implementation of their respective

CBIS projects, as has been shown from the historical information of the two case studies.

It is the proposition of this thesis that the outcome of the MLCD and ID projects has been influenced by the types of cultural interactions that have evolved and taken place during the implementation. Because of the importance and scope of these national projects, the strategies, interactions, and outcomes of them have been analysed from senior executives' and IS practitioners' viewpoints, and this analysis forms the basis for the examination and descriptive review in this thesis. Different models of cultural behaviour were applied to the observations made during the fieldwork in order to provide a descriptive analysis of the factors involved, which will be discussed in the next chapter.

6 Analysis and Insights

In Chapter 4 and 5, the Malaysian government survey analysis and case studies on the CBIS implementation process and operating agencies' computerisation activities were discussed respectively.

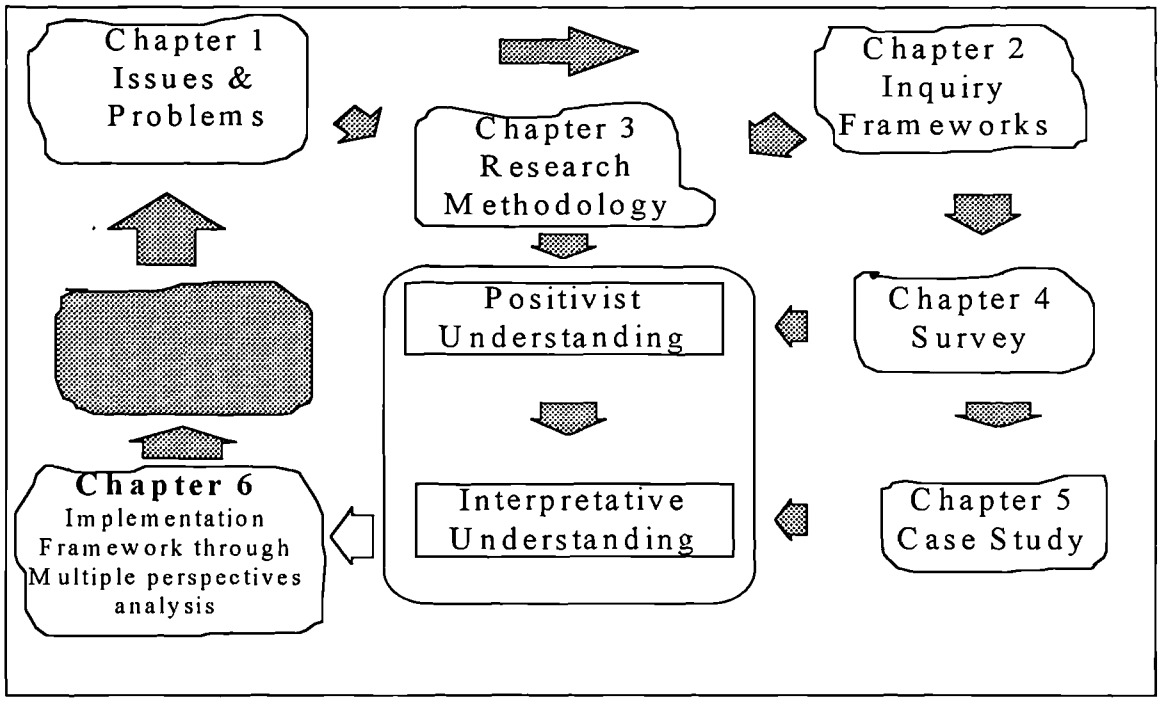

Figure 6.1: Chapter 6 Research Processes

In this chapter, the case studies are further analysed using the Multiple Perspectives Framework with the objective of gaining understanding of the CBIS implementation process in government organisations and obtaining more general insights concerning senior executives' and IS practitioners' roles and perspectives, and the implications of these for practice.

6.1 The Multiple Perspectives Analysis

A discussion of the different approaches available for the examination of observable phenomena can take the form of an infinite regress in the examination of the theoretical basis for each of the approaches proposed. Alternative approaches are necessarily based on propositions that may be shown to have validity, but imply different theoretical frameworks and research designs.

Multiple perspective thinking attempts to resolve this dilemma by the proposition that no single perspective is likely to provide an appropriate generic approach in the study of non-trivial situations. Multiple perspectives thinking attempts to provide a consistent approach to theoretical frameworks and, therefore, research design by taking into account different research perspectives. The multiple perspectives approach is appropriate in the analysis of problem situations that are characterised by complexity. Because the frameworks proposed by the multiple perspectives approach are able to take account of social, psychological, and practical issues, the approach provides a means of revising conventional ideas that have found to be ineffective as strategies that support social cohesion, psychological health, and practical results.

Inevitably, the interdependency of activities within an organisational context needs to be perceived as dynamically interactive and not necessarily sequentially related to expected events and intended outcomes. A set of events deliver results into

another set of events, but as a dynamic coupling of activities that can have a multiplier effect at different levels within the organisation, and have far-reaching, but unintended, effect on the original expectations of the organisation's strategic objectives. The consequences of activity in complex environments are difficult, if not impossible, to predict accurately, although the results of these activities can be experienced in some personally meaningful way.

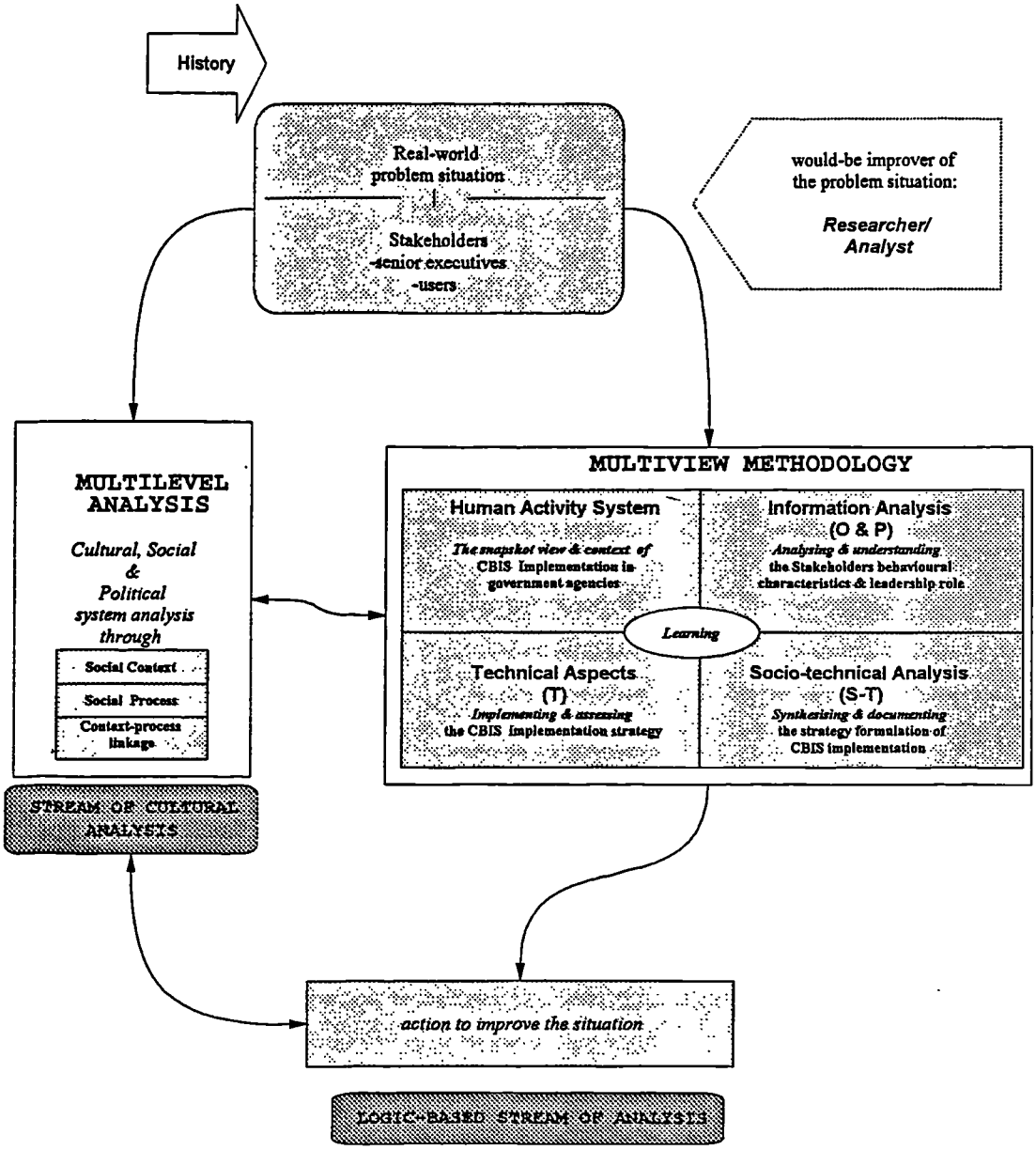

Figure 6.2: A Multiple Perspectives Approach to the CBIS Implementation Process (adapted from Wood-Harper & Avison [1992] and Bell & Wood-Harper [1992])

The model in Figure 6.2 shows the multiple perspectives methodology as a learning process. This schematic shows that action to improve a situation delivers results into the dynamics of multilevel analysis and perspectives, which in turn, feeds into the dynamics of the multiview analysis. The implication is that the steps of the multiview methodology are linked in a constant learning cycle. Appropriate knowledge frameworks are included within the overall framework. The multilevel perspectives focus on context, process, and context-process linkage using Walsham's Analytical Framework. The multiview component of the model takes account of traditional IS concepts and techniques and couples these traditional values with concepts proposed through soft systems thinking.

The theoretical framework depicted in Figure 6.2 was used to guide the research design and the steps in the research programme. The framework provided a meta-methodology and was examined in relation to the objectives of the research work and methodological focus for the implementation of the research work. As a basis for implementation, multiview (Wood-Harper & Avison, 1992; Bell & Wood-Harper, 1992) and Walsham's analytical framework (Walsham, 1993) were applied in two stages. The implementation was undertaken as follows:

- **Stage One: Problem Recognition Phase**

It is a characteristic of non-trivial thinking that problem analysis needs to be undertaken by considering all aspects and possible aspects of the problem situation. In order to do this, the problem analysis, in the first instance, needs to be placed at the highest level of abstraction in human pondering. This allows the researcher to examine possibilities that may not be apparent by direct observation, but may become apparent by logical and intuitive processes. Psychologically, this process reflects the principle of right-brain and left-brain thinking, and is developed and amplified by the composition

and development of rich pictures that represent different aspects of the problem situation, including groups and individual perspectives.

Rich pictures provide a means of maximising the opportunity of exploring the problem situation by taking into account the evident characteristics and the indistinct characteristics that are archetypal in modelling outcomes. Rich pictures also provide a means of determining the purposeful aspects of the actors involved in the process of change. The assumption is that human activity involves some quality of intentionality, and can, therefore, be defined at the highest level of abstraction, and in terms of the likely practical effect. The fundamental or root definitions of the various stakeholders represent purposeful and intended contributions that will have some action on the structure.

Key iterations of the multiview methodology, in this research study, were the personal, organisational, and technical perspectives of the stakeholders, and, by further iteration, focus was placed on the perspectives of the senior executives and IS practitioners involved in large project implementations in complex multi-layered hierarchies. Root definitions are formulated according to the key sociological and practical factors of Customers, Actors, Transformation, Weltanschauung, Owner, and Environment. The factors represent the dimensions and concern of the different stakeholders, their purposes and intentions, and the environment in which the intended transformation is planned to take effect.

In this study there is a focus on using root definitions that represent the organisational perspectives within the "organisational" and "external environment" of the Ives et al framework. In parallel with this, is a focus on the personal perspectives of various stakeholders within the "behavioural" component of Ein-Dor and Segev's framework. The latter approach includes an analysis of the behavioural characteristics of senior executives, IS practitioners and users.

Iteration of the multiview process was undertaken by examining social context and social process through multilevel analysis. This provided an enrichment of the root definitions by a coupling of multiview and multilevel analyses. The formulation of root definitions was a key activity in the research process enabling the appropriate aspects of Human Activity Systems to be examined and system models formulated. The processes described enable the problem situation to be identified and problem resolution to be undertaken by establishing a consensus of intentions among the participants. The establishment of co-operative agreement enabled the second major stage of multiview methodology to be initiated and involved Information Analysis.

Information Analysis includes the analysis of entities, attributes, functions and events in line with the co-operatively agreed objectives of the system implementation. Resources need to be available to meet these objectives and are allocated according to the socio-technical and co-operatively agreed purpose of the implementation. The Information Analysis stage of multiview is dynamically related to the context-process linkage analysis, which is a component of multilevel analysis. The interaction of these two approaches provides the opportunity for insights into the implementation of research designs, and the opportunity to further adapt or refine the original conceptual frameworks.

In practice, in environments that are characterised by complexity and conflict, the implementation phase needs special consideration and is discussed in more detail in the following section.

- **Stage Two: Strategy Formulation and Implementation Phase**

In this research study, the result from Stage One of the analysis were used to formulate an implementation strategy. This strategy includes the remaining stages of

the multiview methodology. These stages include socio-technical factors involved in the implementation of CBIS technologies, the capabilities of the technical expertise available, the allocation of the available resources, and the appropriate methodologies, tools, and techniques that can be made available to IS practitioners in order to make effective interventions in complex environments characterised by risk and uncertainty in CBIS implementation processes, due to weak or inadequate infrastructures.

6.1.1 Human Activity Systems/ The Social Context

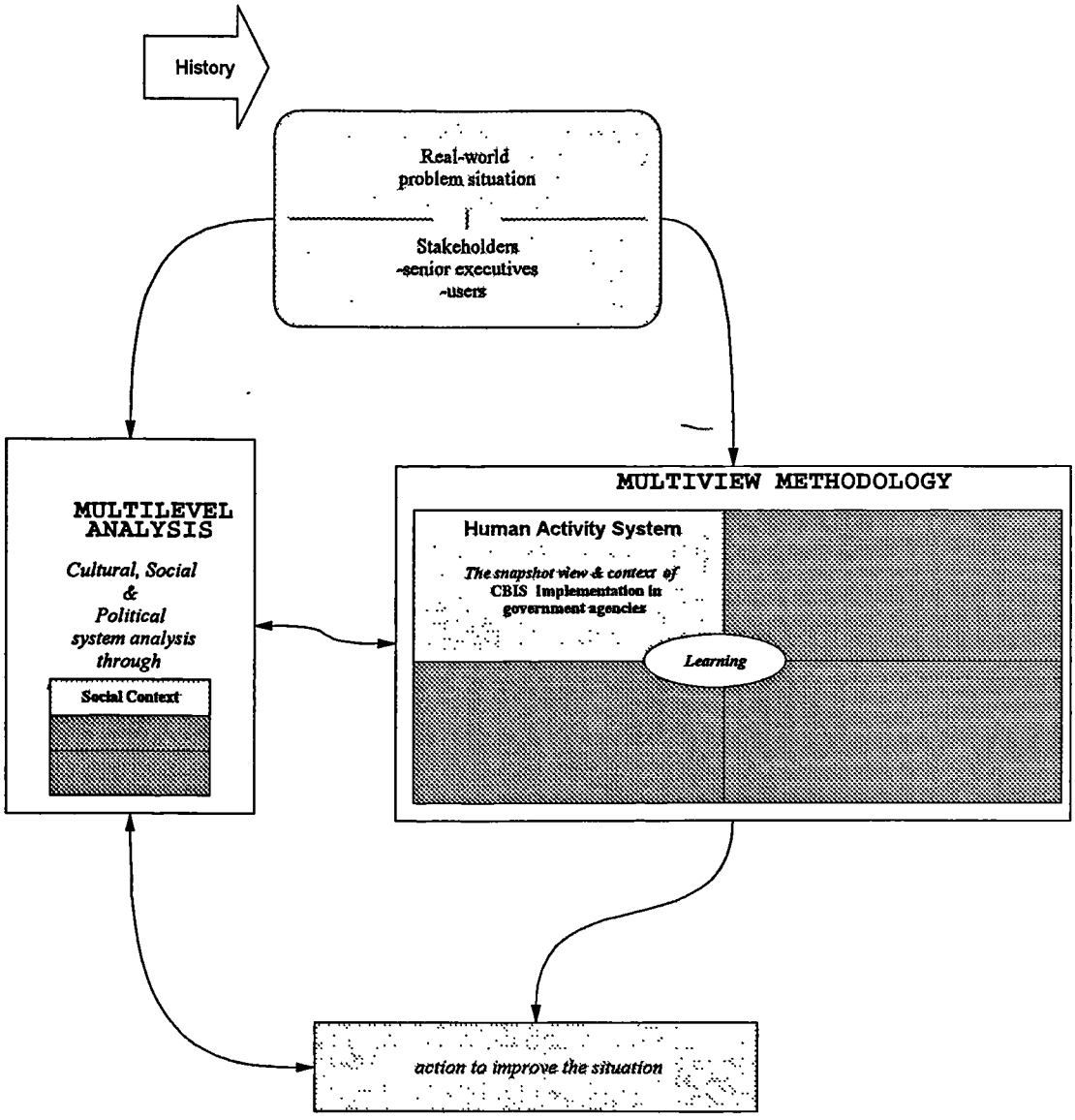

Figure 6.3: Multiple Perspectives: Human Activity System/ Social Context

The Malaysian government organisations operate within a framework of formal guidelines, which have developed historically as central government agencies became more aware of the benefits of computerisation. As discussed in the previous chapter [Chapter 5, p. 167], the first major computerisation project involved the computerisation of payroll routines at the National Electricity Board in 1965.

Growing recognition of the need for national policy guidelines prompted the "International Conference of Computerisation for Development - The Research Challenge" in 1988 and the associated central policy statements on IT in Malaysia. These policy statements were incorporated into the Sixth Malaysia Plan (1990) and re-enforced in implementation.

These policy directives and guidelines have remained the core issues in government thinking up to the present time. Despite the detailed formulation of policy, procedure, and guidelines and the wide dissemination of operational information, the survey analysis shows that IT project success is perceived to be below expectations. This perception is considered to be valid within the social context of IT implementations.

The analyses of the results from the survey questionnaire provide a focus on the social context in which implementations take place within the relevant organisational departments. The associative variables are prevalent leadership roles that exist within the hierarchy, the impact on the perceptions of IS practitioners, and the level of project success that is being achieved within different areas of government organisations.

The questionnaire survey highlights the prevalent leadership roles adopted in MGOs as the key independent variables, which influence the role of IS practitioners and project outcomes. Because it is the objective of the research to understand

observable phenomena that occur within CBIS implementation processes, the multiple perspectives framework, which incorporates the multilevel analysis and multiview methodology, was adopted for analysis purposes.

The multiple perspectives framework and analysis provides, triangulation with the findings of the survey results. However, the survey results provide only a discrete observation and do not describe the social context in depth. The multiple perspectives framework provides the tools whereby the systems analyst (also referred as analyst) can examine not only perspectives, but components of perspectives held by the various stakeholders.

- **Rich Picture and Root Definition**

The key aspects in the multiple perspectives analysis in the context of CBIS implementations in MGOs were identified. The focus is in line with the objectives of the thesis. These are the personal perspectives of the senior executives involved and IS practitioners. Also, the technical perspective of the IS practitioner was considered relevant to the real-world outcomes in the application of technology within government departments.

The technical perspective of the IS practitioner was identified by developing a rich picture, capable of revealing aspects of the overall problem situation from the viewpoint of the project leader and analyst. These aspects are shown in Figure 6.4. The elements considered in formulating the root definition are shown in the CATWOE associated with this rich picture (Table 6.1:CATWOE developed on the IS practitioners' Technical Perspective).

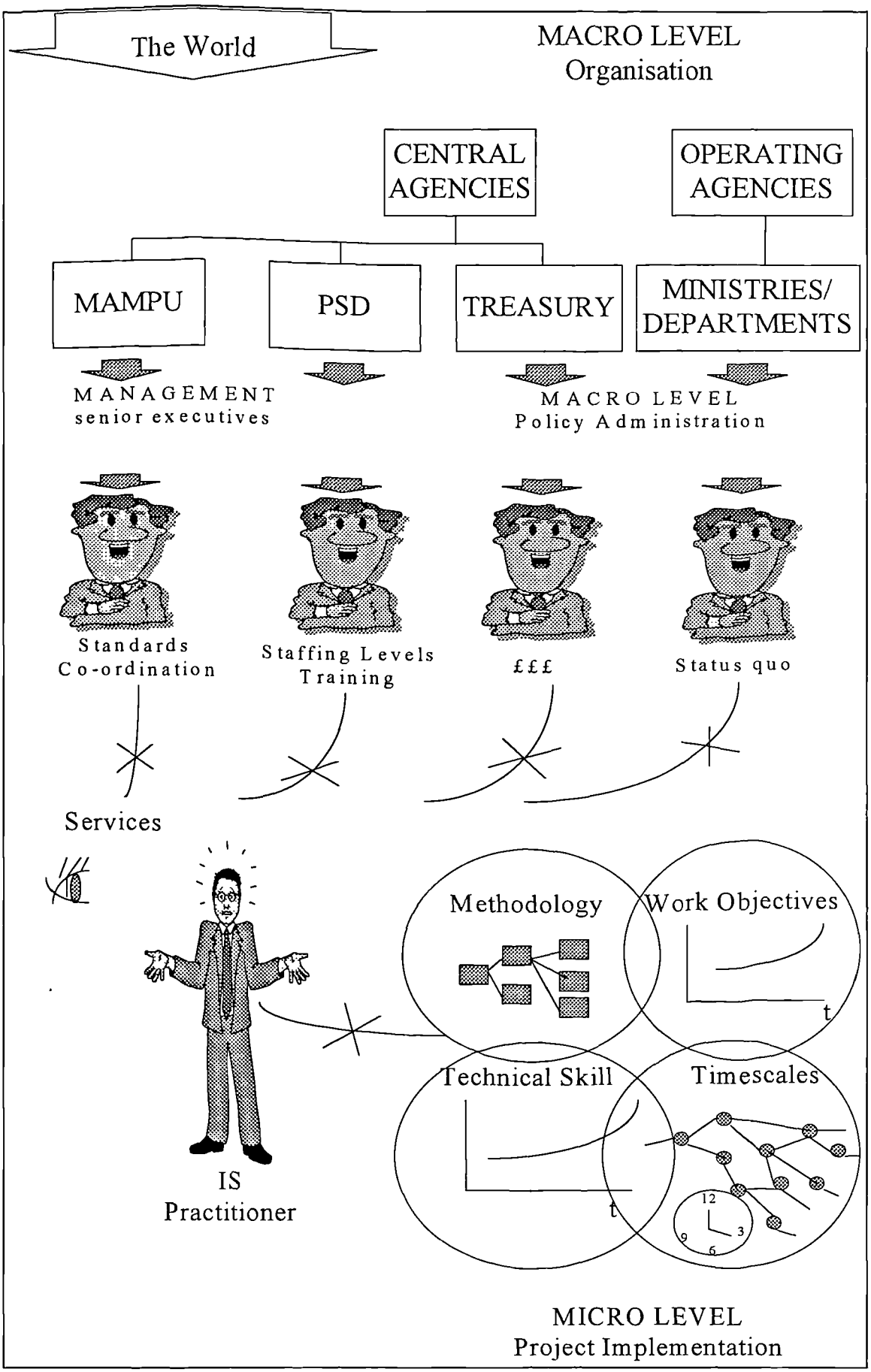

Figure 6.4: Technical Perspective - IS Practitioner

The analyst perceives the formal work objectives very clearly and the amount of work involved. The objectives are designed to meet the requirements of users, and middle and senior management. These objectives, if they are to be properly implemented, require integrated sub-system developments. The need for an effective design approach and design strategy is clearly understood. However, from the analyst's viewpoint, senior management has not provided sufficient political emphasis on the project and the infrastructure, including appropriate provisions for a suitable methodology and training programme.

In the same way, the analyst feels he may come under pressure to produce technical "miracles" with existing analysis and programming skills to meet the time scales imposed by senior managers, their monitoring, and general expectations; in other words, to ensure the success of the project as a whole. The only practical solution perceived is for the analyst to rely on his own abilities and specialisation, which have been developed in the past largely by his own efforts, rather than on effective training programmes. The analyst's analysis and design skill level may not be adequate to the task, although a series of "quick fixes" might serve to meet objectives within the time scales, as a practical tactical approach to the problem.

The analyst is convinced of his role as the prime mover throughout the project's design, test, and implementation stages. There is a feeling that the outcome depends on his personal expertise, efforts, and determination to overcome any obstacles that the project may present up to completion. The worldview of the analyst is that senior management neither understand the technical aspects of the project, nor participate or attempt to participate in an exploration of the problems involved. The analyst perceives a task-dominated environment, a lack of senior management participation, and a sense of "technical alienation".

The application of multiview methodology enabled the formulation of the Personal Perspectives of the IS practitioner. The rich picture developed is shown in Figure 6.5: CATWOE developed on the IT Practitioners' Personal Perspectives (Table 6.1)

The use of the multiview methodology also showed that certain technical perspectives and personal perspectives reinforced each other from the IS practitioner's standpoint. At the same time, different perspectives emerged.

The sense of "technical alienation" from senior executives, derived from the analyst's technical perspective, filters through into his personal perspective as a sense of "being undervalued". The analyst's technical work is not understood and his ideas are considered "theoretical", creating the impression of "abstraction" rather than "action", in his personal view. This view has a personal impact on the analyst in that he rationalises his technical perspective into the personal view that his full potential is neither being realised nor used to support the personnel administrative functions.

IS practitioners' placement and training appears to be made in an uninformed manner. The analyst's view is that "technicians should be managed by technicians." IT management appointments favouring appointees with purely administrative backgrounds, with no "track record" in IT project participation, bring the analyst into conflict with the PSD hierarchy. Besides, these administrators have had no clue as to what sort of training and skills are required by the IS practitioners.

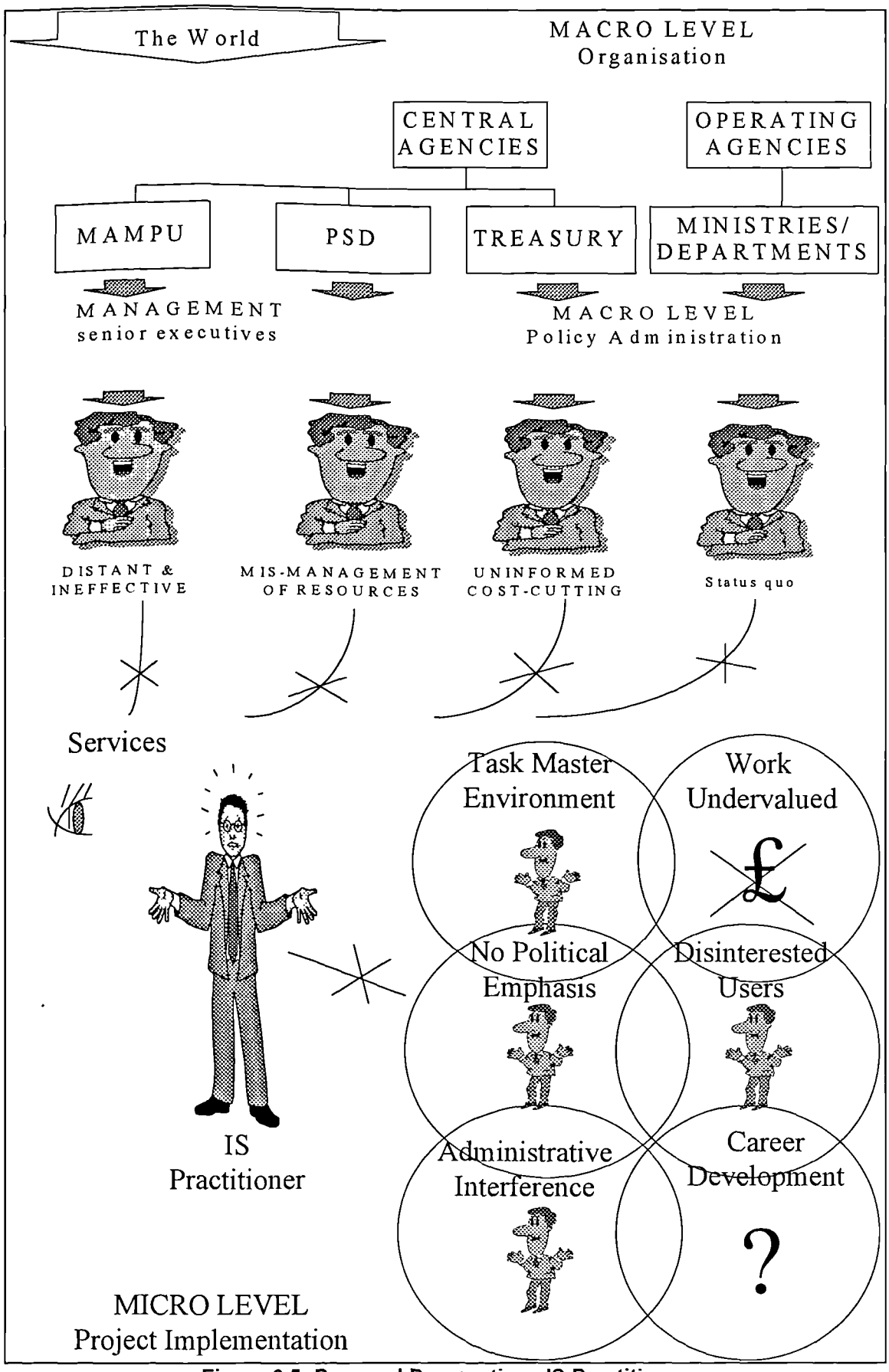

Figure 6.5: Personal Perspective - IS Practitioner

Table 6.1: Root Definition for IS Practitioners

	IS Practitioner: Technical Perspective	Personal Perspective
C A T	• The user departments • Analysts, Departmental Managers and their User Groups • To enhance the effectiveness of departmental activities by providing computerised systems	
W	• The design and implementation skill levels are inadequate to meet the objective. The supporting knowledge infrastructures are too weak.	• The only purposeful actions will be taken by the analyst/ programmers. A project failure will be attributed to them. The credit for a project's success will be claimed elsewhere within the hierarchy. There is a need for caution and circumspection at every stage.
O	• Departmental Managers	
E	• The User Departments	
Notes	• The analyst perceives the problem situation as the design and implementation of computerised departmental systems. His purposeful view is, however, coloured by a lack of confidence in his ability to complete the task. The use of adjective (attribute) 'knowledge' suggests technical knowledge levels within the IT function are not equal to the task.	• The analyst perceives the problem situation as political. He believes that senior executives are not ethically involved in the CBIS process. The inference is that the analyst feels himself to be in a 'no-win' situation, and may surround himself with defence mechanisms in anticipation of the possible effects of political power play.
	• The analyst perceives that the technical skills and infrastructures are inadequate to meet the requirements. During periods of crisis, he does not expect even short-term positive management intervention. He is concerned about the politics surrounding the project. Because the implementation has been agreed, it must go ahead. The inference is that the analyst will take counter-measures that will be defensive in nature. Because he has specialist skills and is aware of the cultural climate in which he is working, he may attempt to 'de-skill' the project from the outset. This may involve highlighting technical issues designed to direct the participants' thinking away from a professional implementation to one of meeting some minimal requirement which may have only a short-term life-cycle. He may feel that a series of tactical 'quick-fix' programming solutions will support his general strategic approach. In the circumstances his view may be that no other options are available to him.	

This blow to the analyst's prestige would be softened if the appointee had political power and clout, but this is never the case. A relatively lower-graded administrator may be promoted to IT project supervisory status. This reinforces the analyst's perception that the project is being no political emphasis higher in the hierarchy of the government organisations. It also creates uncertainty about the analyst's career opportunities and the level of fairness in the system.

The analyst approaches members of the user-group sub-cultures without the perceived support of senior managers' political will and authority to make any effective impact. The benefits of computerisation are not explained officially by the top management to the operational staff. The users, themselves, are not inclined to apportion time for system analysis. The users find a sense of security in their existing routines and there is no real motivation to change from their own work practices and autonomy to new systems that may have uncertain outcomes. This is evidenced by the MLCD and ID case studies. In both agencies, users saw computerisation as an additional burden added to their existing heavy workload.

The resulting view held by the analyst is that the project implementation is not an exercise in technical merit that will enhance organisational objectives, but a complex political interaction. The actors in this interaction are the senior executives within the central and operating agencies. MAMPU does not provide support for standards, nor in the areas involving appropriate levels of infrastructural resources and inter-departmental co-ordination. The PSD reinforce their own structure and authority by appointing administrators to look after the placement, training, and career development of IS practitioners. The Treasury emphasises the need for strict cost controls to the operating agencies, which empowers senior executives with "factual" information by which they can take "appropriate action". This action is to relate poor CBIS project success to IS practitioners. The IS practitioner believe that project success is due to his

own initiatives, although credit for his initiatives will be claimed and reinforced at a senior level by the senior executives, on the basis of good management interventions.

The IS practitioner believes the problem situation to be political. The analyst is unlikely to abandon his strengths, skills training, and structured approach to problem solving. The IS practitioner's practical solution to the problem situation is to adopt a defensive and pacific attitude towards the environment in which he finds himself. The likelihood is that he will act in a cautious and formal manner, and be reticent in communicating ideas that may enhance the design and implementation of IT projects but attract criticism should this additional creativity cause any slippage in project time scales.

The attitude of senior executives, on the other hand, is that the technology is necessary, but difficult to manage and control. Their view of IS practitioners is that analysts are key personnel in technical implementations, but specialist and narrow in outlook. From the various mission statements issued by senior executives in the central agencies or operating agencies within the Malaysian government, it is clear that the objective of senior executives is to ensure the effective use of public resources in the implementation of technological projects. This central objective has created the environment[17] appropriate to the Task Master leadership role, with a focus on meeting short-term objectives within budgeted provisions. An analysis of the mission statements and the resulting structuring of central agencies and advisory committees indicates that the benefits of the technology have been clearly recognised at the highest levels within the Malaysian government. Despite this, the analyses of the survey data indicate that project successes are perceived to be at only average or below average levels.

---

[17] Wilcocks and Harrow (1992) also argue that managers in the public sector operate under an environmental constraints such as: working with unclear, ambiguous objectives due in part to multiple values and goals; being publicly accountable while subject to political timetables; and working in large hierarchical organisations with mechanistic cultures.

The evolution of policy and policy implementation and formal structures was examined in section 5.1 of Chapter 5 - "Overview of the Malaysian Government Organisations". In order to understand the informal aspects of senior executives' thinking within the Malaysian government, a rich picture was developed, as shown in Figure 6.6, in order to examine the personal perspectives of senior executives. From this, a root definition relating to senior executives' personal perspectives was formulated by means of the CATWOE shown in Table 6.2.

This analysis provided the root definition of the senior executives' work according to their personal perspectives, which is to "implement technological projects while maintaining the status quo within the local, state and federal hierarchy."

The worldviews of the senior executives in MAMPU, MLCD, and ID are encapsulated in Table 6.2, in sections (i), (ii), and (iii) respectively. The consensus worldview is given in (iv). One view of the senior executives is that there is a need for tight cost control on IT expenditure throughout MGOs.

This dependency on lower levels of the hierarchy for control information and interpretation of data output is to some extent mirrored within the MAMPU's control function. It has become difficult for MAMPU to maintain knowledge and control of rapidly changing technological developments in the technology marketplace, and of how these technologies are implemented at lower levels of the hierarchy.

In situations where the technology is empowering the managers and technical staff at lower levels of the organisation, the lower levels are now in possession of "factual" information, on the basis of which they can discuss issues of importance to themselves. Such issues may be policy-related and, in this way, central policy issues can be discussed or even challenged by the lower-level subcultures, on the basis of "factual" information.

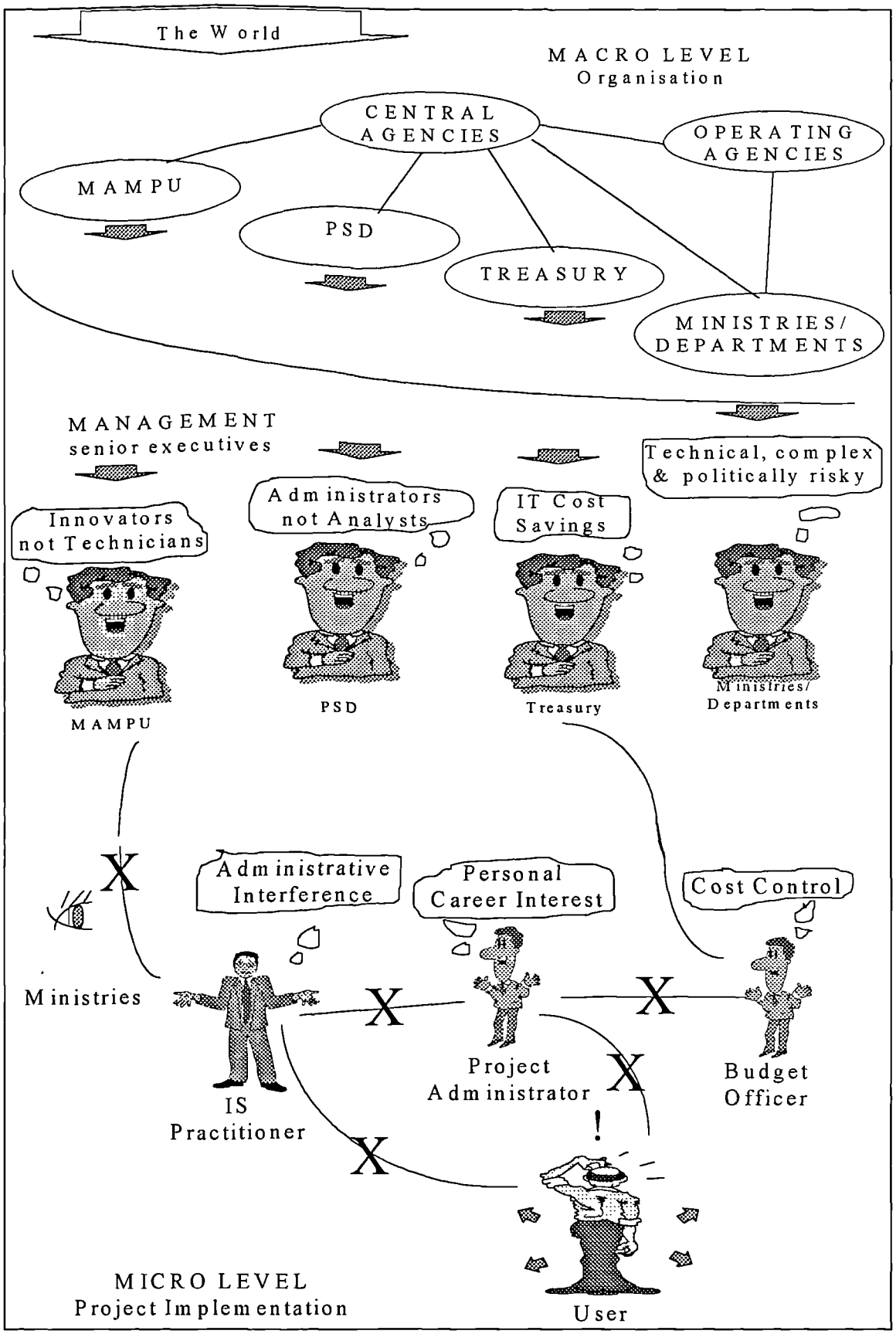

Figure 6.6: Personal Perspectives - Senior Executives

Table 6.2: Root Definition for Senior Executives

	Personal Perspectives - Senior Executives
C	• Self and operating units
A	• Analysts and Departmental Managers
T	• To improve data integrity, information-handling, cost-effectiveness, and decision-making in operating units.
W	i) Technology is expensive with hidden costs. ii) Technological change is difficult to manage. The status quo is being affected. iii) Technicians do not make good administrators. iv) We are losing control.
O	• Self
E	• The divisional operating units
Notes	• The root definition of senior executives' work in terms of their personal perspectives is to 'implement technology while maintaining the status quo within the hierarchy.' i) The view is that the technology *is necessary*, but expensive, with a tradition of extended timescales against agreed timescales, and escalating costs. The attitude of senior executives is that CBIS implementations are largely mechanical processes requiring a disciplined approach and tight control of cost. This implies the Task Master leadership role. ii) The view is that technological change is accelerating, and only those who are fully involved on a day-to-day basis can understand the practical implications of such change. Senior executives understand there is a change in status quo, with a potential drift of knowledge and power towards technical staff at lower levels in the hierarchy. Their defensive stance is that IS practitioners are system-driven and lack vision. The implication is that IS personnel do not understand teamwork, co-ordination, and the wider issues of central resource allocation, the personalities and political interactions at a senior level, and the difficulties in managing resource allocation and performance monitoring across a large area of the MGO's. IS practitioners are recognised as valuable specialist resources capable of development to further specialisation with a narrow focus on day-to-day activities. iii) The view is that administrative skills exist in the real world and have validity in the same way that technical skills exist and have validity. From this viewpoint, the senior executives can legitimise their staff appointments, staff career development packages, and remuneration levels. The view is that administrative skills are distinct from analytical skills, and it might be a risk to promote someone without proven administrative abilities and experience. iv) Represents a consensus view of the senior executives involved in CBIS implementation processes. The CATWOE identifies different perspectives of senior executives in the central and operating agencies, but, however the senior executives legitimise their roles, the consensus view is one of reservations towards IT developments. There is a feeling of potential change that will ultimately affect the status quo and the influence of senior executives, their position, uniqueness, as decision-makers, and authority.

The relationship between analysts and project administrators is characterised by a lack of mutual understanding and respect. The appointment of an administrator to a supervisory role in handling IS practitioners' affairs is often a short-term appointment before further promotion to another area. IS practitioners perceive the PSD as serving the interests of its own staff through such appointments.

The senior executives within the PSD who are responsible for the affairs of IS practitioners are not aware of the right training and developing of the skills of SAs, whose correct career path is via further specialisation in the technical discipline chosen by themselves. These administrators feel that their time is wasted in particular IS supervisory roles and seek career progression to other areas.

The emphasis on a system of bureaucratic administration is rooted in the traditional thinking within central government. Traditional thinking is characterised by a system of central policy-making that is designed to provide a reconciliation of the diverse social and cultural needs of a multi-layered society over dispersed geographical regions. While senior government executives and administrators do not actively resist technological implementations, the growth of such implementations is viewed with some caution by the senior executives. Senior executives are unsure of the social impact of technological issues. Because the impact of the technology is perceived to empower devolutionary processes, with uncertain outcomes, senior executives are reticent about high levels of involvement in technological issues. While the official policy is to support the introduction and widespread use of computer technologies, the attitude of senior executives is to understand and evaluate the impact of these technologies within the social context, before becoming fully committed to implementations that involve the widespread use of computer systems with uncertain implications for existing social frameworks and their own positions of power and authority. On account of the nature of their training and acclimatisation to rapid

development and change, IS practitioners feel the need to progress CBIS projects within pre-set timescales.

Table 6.3 (a): Elements Social Context: Historical/ Political Context

CASE STUDIES FINDINGS		MULTIPLE PERSPECTIVES ANALYSIS
MLCD	ID	
• Land Information System (LIS) project was initiated by the Federal Government, in an attempt to establish standardised procedures and practices for effectiveness and efficiency of government machinery. • Land administration, however, is a state matter and therefore involves political issues between state and federal agencies.	• Low morale of workforce. • Not enough investment in equipment/ training for computerisation. • Too much workload but not enough personnel to handle it.	• The balance of power has been achieved by tight central political control and the establishment of a huge state bureaucracy that controls staff appointments in breadth and depth throughout the MGOs. • Central management ideology includes the entrenched attitude of a central political elite concerned with the efficient management of a bureaucracy while maintaining the status quo of central political control and directions. • The evolution of computerisation within MGOs through formal organisation and structures is not perceived to have realised the expected results by the different stakeholders. • The drive for efficiency and modernisation has created and sustained a Task Master oriented environment, which is characterised by mistrust, lack of communication between stakeholders, confusion over roles and responsibilities, and conflict between subcultures. • CBIS implementations have come to be perceived by the various stakeholders as an interplay of political forces. There is little common agreement on objectives, a general lack of consultation, and a reluctance on the part of senior executives to become involved or model the environment and social infrastructures in order to maximise the effective use of the human resources available in order to provide a maximum contribution to CBIS project successes. • User groups perceive CBIS implementations as eroding their area of influence and freedom to act. CBIS initiatives are seen as involving interference in existing workloads and as creating additional work with no eventual benefit to themselves. The belief is that their involvement may produce outcomes that are detrimental to their own status, through "outsider" knowledge of their work practices and closer monitoring of their work activities.

Table 6.3 (b): Elements Social Context: Social Relations

CASE STUDIES FINDINGS		MULTIPLE PERSPECTIVES ANALYSIS
MLCD	ID	
• Characterised by personalities of top management leadership in the Ministry. • IS Division in Ministry is merely using government decisions to carry out the ISD function. • CBIS were seen as an act of one agency trying to dominate other agencies.	• DG uses his position to influence decisions made at lower levels. • conflict among managers. • conflict between DP Division and Employment Pass & Foreign Labour Division. • conflict between Operation and Development in DP Division. • Head of Operational Division not significantly involved.	• The social relationships between key groups involved in CBIS processes reflect the social context in which the CBIS implementations take place. • IS practitioners perceive central agency decision-making as distant, inappropriate, and politically motivated. The perception held by IS practitioners of distant decision-making and downwards communication creates a belief that the system and style of management thinking will not change in the future. IS practitioners translate this belief into a defensive attitude in relation to their work practices. • Central agencies perceive the implementation of formal structures and procedures as the key to successful outcomes. The belief is that work practices need to be structured, efficient, and focused on short-term results to meet the requirements of limited budgets.

Table 6.3 (c): Elements Social Context: Infrastructure

CASE STUDIES FINDINGS		MULTIPLE PERSPECTIVES ANALYSIS
MLCD	ID	
• No significant contribution or direction from the top management to push the CBIS project forward. • Lack of professional guidance from Land Administrator towards operational staff and project team.	• Poor management co-ordination (e.g. computer steering committee and project board dissolved). • Poor co-ordination among members of the Division. • Weak monitoring system (e.g. Policy Research and Training Division). • inadequate skills/ experience in DP project team.	• The social infrastructures within MGOs are rigid and inflexible towards IT processes. • Cultural attitudes have not been successfully influenced, and attitudes have initially polarised towards cultural myths in relation to IT processes. • Senior management thinking is oriented towards structured and disciplined work effort, and holds to the belief that the imposition of routine will, as a matter of course, produce efficiency and results. • There is little recognition that the IT process is multi-purpose as a management tool and involves the interfacing of different skills, knowledge levels, and initiatives. • Successful IT processes cannot be departmentalised in the sense that manual systems can be made more efficient by the division of tasks across different functional groups. Successful IT processes depend on the individual initiatives of stakeholders and a co-operative attitude towards producing systems that have added-value. Added-value includes the opportunity for the organic evolution and development of all the participants in the process. • In the case of MGOs, the cultural infrastructures lack the co-operative elements that are required for overall system success. • At the current time, the social infrastructure that is necessary to support successful IT processes is one of conflict rather than one of co-operation, or at least, optimism.

6.1.2 Human Activity Systems/ The Social Process

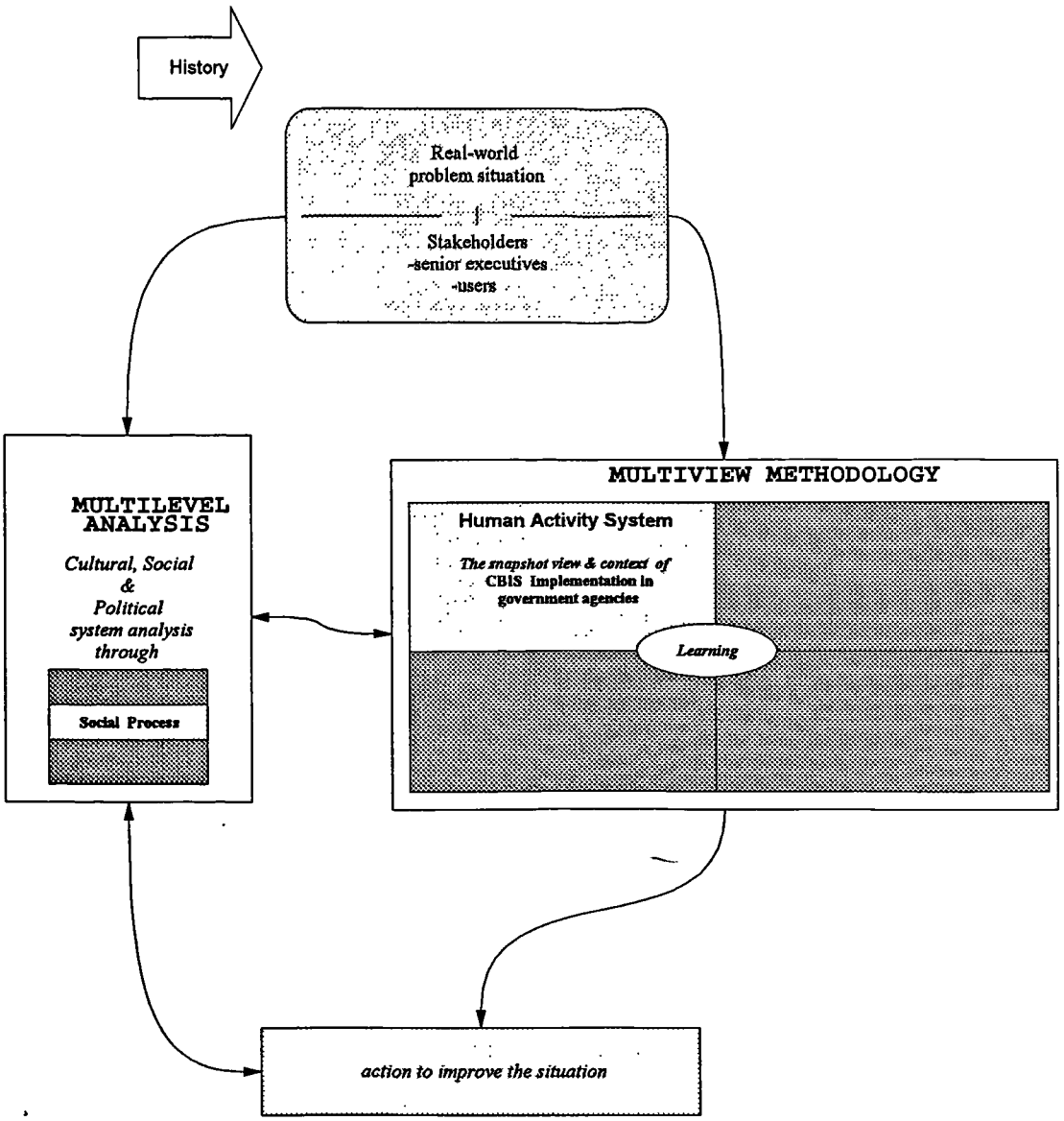

Figure 6.7: Multiple Perspectives: Human Activity System/ Social Process

A key component of the strategic objectives of senior executives within Malaysian government organisations is the aim to maximise the benefits that can be realised through the widespread use of computer and telecommunications technologies at different levels within the hierarchy.

Senior executives within the government agencies have identified the need for modernisation and change to bring about an information-rich society, and have created the formal organisational structures that support these aims. These changes in operational activities and work practices are perceived as legitimate objectives in view of the changing needs of Malaysian government organisations. The perception of senior executives is that those organisational needs and activities should be flexible and adaptable to change in real-world situations.

If the successfulness of the changes is measured by the success of CBIS implementations, the results of the survey analysis indicate that the benefits of strategic technological implementations are below expectations.

The examination of the MGOs' organisational culture using rich pictures and root definitions indicates conflict between stakeholders and the subcultures involved in technological implementations. The inference is that while there is a need for change within the MGOs, there are different cultural perspectives on how this change can be realised and its effect on the individual stakeholder or on a particular sub-culture.

Ultimately, senior executives are responsible for managing the process of change both at the formal and informal levels within the organisational hierarchy. The organisation underlying cultures may remain constant, although the organisation's needs and activities may regularly change. The lack of participation by senior executives in CBIS projects indicates a formal approach to tactical implementation of central policy. This represents a formal perspective held by senior executives of their role in creating change, and a perspective based on a Task Master leadership style legitimised through the reinforcement of official policy and mission statements.

The participation of senior executives is further restrained by their personally held view that technological implementations are difficult to manage and affect the

status quo by empowering stakeholders at lower levels of the structure. Technological change does, however, empower stakeholders whereas previous empowerment of stakeholders was largely dependent on senior management

The dramatic increase in knowledge workers in itself has presented a problem in personnel development. Knowledge work was originally the exclusive province of managers and senior executives whose responsibilities were to deal effectively with issues of uncertainty, change, and other imponderables. Staff responsibilities could be rigorously defined with obedience to a set of norms, often repetitive tasks, demanding little in terms of knowledge and decision-making.

The introduction of CBIS has elevated IS practitioners to the level of knowledge workers, dealing with imponderables and having to make decisions which may have far-reaching effects. The traditional view of power and authority residing with senior executives and downwards communication of instructions and ideas has become less tenable.

The approach used by senior executives towards project co-ordination has been to establish formal systems and structures of administration. However, the survey results indicate that the intentions and management objectives of such leadership styles have not provided effective catalysts in either the issues of project co-ordination or those involving the reconciliation and management of conflicts between stakeholders and sub-cultures.

Despite the establishment of MAMPU, the survey results indicate that the expected results have not materialised within IT departments in the form of executives' participation in CBIS projects and executives' relationships with IS practitioners. The predominance of the Task Master management style, identified in the survey analysis,

suggests downwards communication and a lack of recognition of IS practitioners as knowledge workers.

Knowledge workers often have specialist knowledge and are categorised or labelled by this specialisation. In the real world, knowledge workers are often faced with making decisions that are multi-disciplined in nature, involving complex areas of judgement and risk. The evolution of the knowledge worker requires new perceptions on the part of senior executives, new methods of working, and new infrastructures. Because the knowledge worker is a decision-maker, he can make substantial contributions to the organisation either directly in his day-to-day activities, or indirectly by influencing management decision-making, management thinking, and processes involving adaptation and change.

Senior executives perceive the process of CBIS implementation as specialist, structured, and technical in nature, and, therefore, the responsibility of IS practitioners. This perception is shared by IS practitioners in the sense that IS practitioners' technical perspectives focus on the need for methodologies, training, and appropriate technical infrastructures.

This focus by senior executives and IS practitioners on the narrow technical aspects suggests that both senior management and analysts value the specialist, structured and technical nature of computer systems. These perspectives may lead to the view of the technology as a panacea for organisational needs.

In practical terms, this issue relates to the question of enhancing the contribution of all knowledge workers - senior executives, managers, IS practitioners, and user groups - by adopting appropriate management strategies according to the identified needs of the organisations involved. It should be noted that, although design methodologies and concepts have proliferated over the years, the recognition of

participants in CBIS development as knowledge workers has been either underrated or ignored.

The perception of participants in CBIS development remains largely one of subordinate staff working with narrow proficiencies that are only applicable to meeting shorter-term management objectives or urgent developments that suddenly become apparent. This view is characteristic of the Task Master perception, and the resulting management strategies may produce shorter-term results, but they tend to ignore the potential benefits that can be gained by focusing on the generic contributions that are possible within IT cultures through the recognition of human factors.

The survey analysis identified three main areas of concern expressed by the participants during the survey explorations. These concerns relate to factors involving perceptions and human activities. These factors were associated with average or below average profiles of the associated variables during the analysis of correlation from the survey data.

The areas of human activities and interactions that have been identified as areas of concern can be grouped into three categories: communication, conflict, and job satisfaction:

- **Communication**

MGOs are characterised by task-dominated thinking, with downwards communication involving the setting of objectives and timescales, and the imposition of work methodologies. There is a lack of recognition of IS practitioners as handlers of symbolic information and wider areas of knowledge than their own chosen area of specialisation. IS practitioners have evolved into decision-makers who need to make judgements on user requirements, resources, timescales, and what can realistically be

achieved rather than what users expect to be produced. IS practitioners could make contributions to organisational performance over a wide range of organisational activities. Because they are closer to real-world situations than senior executives, they have the opportunity of providing valuable feedback to senior executives for planning and tactical purposes.

- **Teamwork/ Conflict**

The survey results indicated a lack of cohesion between participating parties: senior executives, managers, IS practitioners, and user groups. Each group exhibits the qualities of its own cultural perspectives, which are hostile in nature to other sub-cultures. This may indicate a syndrome of self-fulfilling prophecies that interrupt the flow of design work, systems implementation, and system usage.

- **Self-development/ Job Satisfaction**

The variables associated with job satisfaction were used in the survey to establish how the participants viewed themselves and their future within the existing boundary conditions imposed by the management policies adopted by MGOs. The results indicated that IS practitioners, in particular, are obliged to concentrate on output rather than input and wider contributions. IS practitioners are uninformed of overall operational problems, which limits their viewpoints towards immediate tasks. The tasks they undertake lack challenge and actual involvement in changes, and they tend to be defensive rather than contributory activities. There is a higher than expected malaise and lack of job satisfaction.

Overall, there is a lack of utilisation of personnel within MGOs. In addition to the adoption of structured design methods, prototyping of management strategies needs to take place to enhance the below average profiles identified above

In order to resolve these problem situations involving communication, conflict, and job satisfaction, there needs to be a recognition by senior management of the informal processes that are taking place during project implementations.

Table 6.4 (a): Some Elements of Social Process: Cultural Perspective

CASE STUDIES FINDINGS		MULTIPLE PERSPECTIVES ANALYSIS
MLCD	ID	
• Decision to computerise LIS made by the Cabinet, with Ministry seeing its role as technical implementation. • Incompatible perspectives of subcultures of state land offices and KPTG during development process. • Top management in the Ministry unaware of need to influence cultural change.	• Mistrust and differing views between divisions (DP, PRT & EPFL). • Management insufficiently aware of the need to influence cultural change.	• The cultural perspective of IS practitioners is conditioned by the accepted CBIS interpretative scheme. Traditionally, CBIS thinking includes the idea that the technology is rapidly innovative, requiring high levels of skill, training, and technical infrastructure. It requires professional management and is associated with high professional status. The IS practitioner does not see himself as a reformer or as an emancipator, or in any other role other than that of a designer and implementor of objective systems that can revolutionise organisational performance. • Users perceive CBIS processes with reservation depending on their motivations. Because users are expected to become involved and "surrender" their knowledge to the IS practitioner, they may feel they are being forced to surrender their "territorial rights" to an outsider. The outcome is uncertain for the user, who may be assured that the outcome will be a less arduous workload, but he may feel that CBIS processes are no guarantee of a reduced workload in the longer term. Often no incentives are provided to users because senior managers are unaware of the users' perspectives. • In the same way, senior management is not aware of the analyst's conditioning as an agent for rapid change and the propensity to directed action on the information structure by the analyst. IT skills demand long periods of concentration, and disruptive environments can create not only demotivation but interfere with the delicate mechanism of concentration. The analyst requires a smooth working environment, with the minimum of cultural conflict, to support his activities. Also, the analyst needs to be trained to see himself acting out other roles than that of an agent for rapid change.

Table 6.4 (b): Some Elements of Social Process: Political Perspective

CASE STUDIES FINDINGS		MULTIPLE PERSPECTIVES ANALYSIS
MLCD	ID	
• Resistance from KPTG resulted in no effective participation during development process. • Top management showed lack of vision and direction towards the monitoring and control of the project's implementation.	• Open conflict occurred regarding control in the MRC processing. • Management showed lack of capability in managing co-ordination and performance.	• Senior executives (SE) perceive CBIS processes as narrow technical exercises, complex in nature, and difficult to manage. Management intervention by senior executives can be time-consuming, distracting from other urgent matters, and non-productive. • Although the view that the role of SEs is to manage and it is not practical for SEs to become involved in day-to-day technical matters, there is a need at least to influence day-to-day activities through appropriate management involvement. The ethical modelling of groups' behaviour can take place at a distance, without the over-involvement of SEs using the appropriate management techniques. • SEs can implement structures and systems to reduce conflict between subcultures within the hierarchy and create new norms, and should undertake this as an accepted responsibility and a part of the management process. • The view of stakeholders that CBIS processes are political processes needs to be changed by a consensus view gained by stakeholder participation and management arbitration. Decentralisation of CBIS processes to free them from central political encumbrances can co-exist with centralised political policy-making. • As long as central politics are mixed in with IT initiatives, the full benefits of CBIS processes are unlikely to be realised.

6.1.3 Information Analysis/ Context-Process Linkage

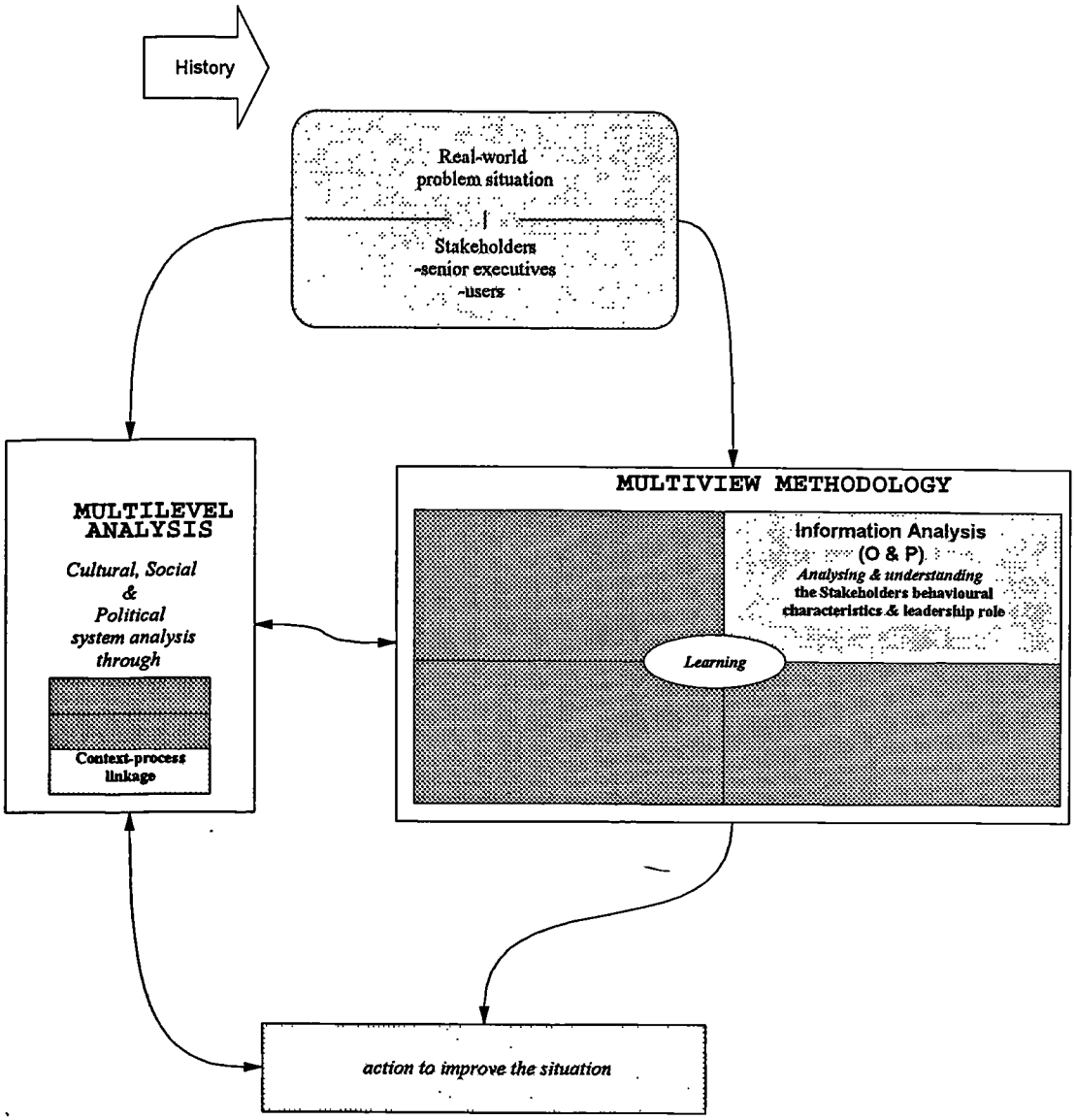

Figure 6.8: Multiple Perspectives: Information Analysis/ Context-Process Linkage

The analysis of stakeholders' perceptions using Multiple Perspectives analysis confirms the perceptions recorded through the survey analysis. The success of technological implementation within Malaysian government organisations is below that of the expectations of various stakeholders.

The organisational climate within which these implementations take place is one of conflict between the subcultures involved. Although formal structures have

been implemented and developed over the years, the results of these actions have not produced the intended results.

The survey analysis and the results and observations drawn from the use of the Multiple Perspectives framework indicate that the factors influencing the outcome of CBIS implementations are related to the human activities involved in computerisation projects and the social context within which these activities are taking place.

The introduction of technology, rather than contributing to the binding of organisational structures, is contributing towards fragmentation. The analyst views the technology as significant in providing structured systems of information processing with the potential for major contributions to the organisation's information needs. It also provides the potential for the analyst's self-development to higher levels of skill, job satisfaction, and personal, along with organisational status. This view is considered as legitimate by the analyst, but is frustrated in its objectives by other subcultures.

The analyst has a vast interpretative scheme on which to call in support of his view. This interpretative scheme is based on the traditions that have developed and now surround technology thinking. This thinking assumes that the technology is structured, scientific in nature, cost-effective, and providing methodological solutions to the organisation's information processing needs. The interpretative scheme also includes the concepts of professionalism, specialist skills, and professional status.

Using this scheme, the analyst can make sense of his own role and his own actions in pursuit of his objectives in providing efficient solutions to information processing needs. Using the same interpretative scheme, the analysts can make sense of the actions of other subcultures. This involves the view of the analyst that senior executives and users lack technical understanding of the implementation processes. The analyst believes other subcultures are concerned with maintaining the status quo

and they are likely to consider CBIS implementations as a threat to their status and capable of reducing their own areas of power and influence.

The interpretative scheme adopted by the analyst tends to exclude the exploration of alternative approaches to implementation, other than by means of the hard systems thinking that is the worldview of his professional training. The analyst's perception of other stakeholders' wishing to maintain domination is that this is unethical. The resulting action on the structure by the analyst is towards emphasising his narrow technical significance within the structure, and towards being defensive or hostile to stakeholders who lack a technical appreciation of his work. Communication is blocked and other forms of communication, particularly of a non-technical nature, may not be considered.

The technology itself has empowered the analyst and, as this process continues, the analyst feels less dependent on empowerment from senior executives, whom he regards with less awe as people only capable of Task Master role and unable to participate effectively in CBIS project management.

Being a professionally trained analyst, the IS practitioner accepts the norms of professional management and the requirement for a sense of technical direction, leadership, and support in project management. The appointment of administrators rather than technicians to look after the affairs of IS practitioners is perceived as unethical and an attempt to maintain administrative domination of what is a highly technical function requiring astute technical understanding and management.

The analyst understands that results need to be achieved, or sanctions will be applied that will reduce his status and value within the structure. The analyst is likely to behave defensively and cautiously in the approach to his work, experiencing no job satisfaction, which may reflect in the quality of his work. The work may be of relatively

little value compared with the potential benefits of innovative systems that benefit all stakeholders. It may be only a minimal mechanical contribution, representing a symbolic act of obedience to existing norms of management behaviour with which he disagrees.

Competent analysts could act in a knowledgeable way and make judgements on the value of data. The scope of data processing provides the opportunity to examine both data inputs and information outputs. It also provides the opportunity of increasing both the quantity and quality of data inputs, compared with manual routines. In order to maximise the opportunity of developing an added-value system, the consideration and contribution of all stakeholders are required.

It is unlikely that genuine consideration and contributions can be forced by top-down Task Master leadership styles or by political manoeuvring within the structure aimed at domination. In this sense, the value of CBIS implementations is dependent on the skills and experience of all the participating cultures. Their interactions and interpretative schemes in relation to the organisations' information processing needs are likely to determine the level of success achievable through CBIS implementations in producing a system of shared meaning.

By the same argument, the level of success of CBIS implementation can be considered as being related to the level of social integration that has been achieved by the organisation itself amongst its subcultures. Information processing systems reflect a duality of structure and depend for their success on the social contexts and processes that exist or are occurring within the organisation. Because CBIS implementation reflects social context and social processes, such implementations could, and perhaps should, be regarded as learning processes and object lessons for all the participants involved in these processes.

This particularly applies to senior executives, who are ultimately responsible for the implementations. Although senior executives may not have the technical skills to fully appreciate the details of CBIS implementations, they have the authority to influence the environment and the processes that are taking place.

By recognising implementations as involving human activities and by placing positive management emphasis on CBIS developments and providing appropriate intervention where it is required, the use of human and computing resources can be enhanced rather than routinised or even wasted.

Table 6.5 (a): Elements of Context-Process Linkage: Strategy and Direction

CASE STUDIES	
MLCD	ID
• SG drew on facility to allocate resources in Ministry to initiate LIS project. • Reflected structure of signification viewing project co-ordination as best achieved through direct control from the Ministry. • Intended strategy was better project co-ordination and monitoring, but unintended consequences included resistance from KPTG and state land offices.	• Legitimation of need for new system by norms of efficient customer service and improvement of its checking and enforcement activities. • Primary purpose for senior management was to exercise control, reduce indispensability, and track malpractice of the staff.
MULTIPLE PERSPECTIVES ANALYSIS	
• Strategy and direction for computerisation within MGOs is a function of the trend of management thinking. • The leadership style that has evolved is characterised by Task Master styles and domination, rather than paternalistic, consultative, and participatory styles. • The trend of management thinking has created a modelling effect throughout the MGOs and norms that reflect formal structures with a lack of attention to factors involving human activity and the need for co-operative action between subcultures. • The roles of the various stakeholders are not clearly defined except at a formal level. The expectations for successful project implementation have not materialised. Role expectation is a key element in role definition. Stakeholders' expectations are creating informal role definitions and role ambiguity. There is a general lack of a consensus on project implementations. • The different stakeholder's are unaware of or unwilling to adopt the variety of roles that are required for successful CBIS outcomes. The actual roles adopted by the different groups of stakeholders are the result of the historical evolution of authority, personal interests and the compartmentalisation of activities. • Management has failed to influence cultural climates, to alter values, and provide balanced behaviour, expectations, and role activities. There is, as a result, role conflict and role overload or underload, creating individual tensions, low morale, poor communications and a lack of objective results • Stakeholders have adopted and evolved their own group interpretative schemes and levels of signification that do not relate to each other's schemes nor the organisation's objectives of efficient use of public resources. • The different levels of signification arrived at by the stakeholders through the evolution of their own interpretative schemes have created fragmentation of views and behaviour that are detrimental to CBIS developments. • This process of fragmentation of viewpoints is likely to continue and reinforce itself through groups norms until there is appropriate intervention and action on the social structure by senior management. • Strategy and direction as historically and currently implemented can only produce results through the individual initiatives of stakeholders. • While strategy and direction is clearly and formally defined, the implementation is more dependent on chance events, and the co-operation of individuals and their personal initiatives and actions to improve the situation.	

Table 6.5 (b): Elements of Context-Process Linkage: Implementation Process

CASE STUDIES	
MLCD	ID
• Signification structure of CBIS as tools for restructuring business process. • Attempt to co-ordinate various agencies' participation were not very successful. The agencies eventually exercise their power by drawing on interpretative schemes of Cabinet decisions.	• Signification structure of CBIS as tools for automation and management control. • Users were not asked to participate but were merely consulted. • Senior management sees it as technical exercise and assumes it is a problem of technical expertise rather than a social or cultural matter.
MULTIPLE PERSPECTIVES ANALYSIS	
• Implementation of CBIS projects within MGOs is characterised by coping mechanisms such as repression, withdrawals, rationalisations, and unilateral strategies rather than co-operative planning and actions. • IS practitioners feel a sense of role overload in that they are being made to feel personally responsible for all aspects of project planning and implementation. There are no incentives for users to participate in implementations and they feel they have been given no effective role to play in the processes of technological change. • Senior executives expect compliance within given timescales in relation to project implementations and are able to call on domination to enforce compliance. Formal rules, procedures, and sanctions are used to legitimise Task Master leadership styles. • Compliance depends on the influence of domination by senior executives. IS practitioners and users comply but do not personally identify with the implementation programmes nor with the initiator of the influence. • Subcultures within MGOs have no sense of internalisation of CBIS processes. Individuals need to feel a part of the process so that the individual can internalise the process of change in the sense that it becomes, to some extent, a personal possession of the individual involved in the process • Senior managers need to influence the interpretative schemes of the participants so that they are better able to understand the benefits of computerisation and they should provide enhanced interpretative schemes that create a sense of individual meaning and systems that have the perceived characteristics of shared meaning among the groups involved.	

Table 6.5 (c): Elements of Context-Process Linkage: Implementation Status

CASE STUDIES	
MLCD	ID
• Existing social structures were largely reproduced. • No action taken by the top management to create shared structures of meaning. The former SG was personally monitoring the project but the later SG then left it to the capability of the IS Division alone.	• Stages 1 and 2 largely reproduced existing social structures. • Various attempt to sabotage the system resulted in changed action/ structures. • At this stage management should actively intervene to attempt to create shared structures of meaning.
MULTIPLE PERSPECTIVES ANALYSIS	
• Stakeholders view CBIS implementations as objective technical exercises rather than as group learning processes. • Co-ordination of activities involves group representation, negotiation, and high levels of participation and contributions. • Change involves learning, and learning can only effectively take place during the implementation. Feedback is required and a process of listening and upwards communication is needed to highlight problems or opportunities that arise during or following the implementation. • In the first instance, discussion and agreement on role expectations need to take place. These should also provide the opportunity to identify learning needs that may be required to maintain involvement in implementations and to highlight what is relevant during the process. • Task Master dominated organisations and groups that have adopted the authoritarian style of the senior management's interpretative schemes and organisational norms are less able to learn another mode of interaction. • Group representatives cannot always fully accept critical feedback about the behaviour of their group. The introduction of technology into organisations requires a high level of adaptability, and substantial changing in work practices and learning skills. The traditional thinking involving the concept of compartmentalisation of activities can be carried over into new work practices and contaminate them. Monitoring of activities can be seen as intrusive and demeaning. • The onset of problems during implementations can be viewed as the result of a lack of control and poor planning, rather than as a natural component of learning processes. • Co-ordination and monitoring requires the introduction of group consultation and ethical arbitration in relation to work and task responsibilities. Stakeholders need to make their expectations clear in the form of an agreement, and should accept ethical management arbitration during the process of co-ordination, monitoring, and feedback in order to create new modalities through which the MGOs can function more proficiently in the process of technological change.	

6.2 The Proposed CBIS Implementation Framework

From the above discussion it is apparent that the introduction of technology into MGOs has taken place within both formal and informal contexts. The proposition of this thesis is that while formal structures have been implemented by senior executives and technical resources have been provided, the social context and processes have not been fully recognised and successfully influenced that they might adapt and take advantage of the potential benefits offered by the large-scale adoption of technologically based systems.

The Task Master style of leadership adopted by senior executives and the narrow technical approaches adopted by IS practitioners both imply predictive certainty in the outcome of computer projects. The assumption is that a broad-based system can be dissected into its component parts and solutions found in part and then in total by the application of some unalterable laws of physical science.

As a result, implementations remain only partially effective, and much new thinking needs to be done by stakeholders to make better use of the technology and personnel available. It is a further proposition of this thesis that more effective implementations and more successful outcomes can be achieved through the application of methodological frameworks to the analysis of social systems.

This is not to say that there is a set of sociological principles that are reductionist in nature and provide for unequivocal guidance during technology implementations and predictive certainty for effective outcomes. The multiplicity of variables, particularly in large organisations, is so great that it is unlikely that precise solutions will ever become available.

Table 6.6: Proposed CBIS Implementation Framework

Multilevel Multiview Analysis	Social Context	Social Process	Context/ Process Linkage
Human Activity System (derived from personal perspective; leadership roles, & IS practitioners' perspectives: Figure 2.6)	• Rich pictures: Figures 6.4, 6.5, 6.6 • Root definitions: Tables 6.1, 6.2, 6.3	• Tables 6.4 (a) & (b)	• Tables 6.5 (a), (b), & (c)
Information Analysis		• Conceptual models	• Refined Conceptual Models • Physical Models
Socio-technical			• Strategies: (choice of relevant IS tools & methodologies)
Human-computer Interface			• Strategies (choice of relevant IS tools & methodologies)
Technical			• Strategies (choice of relevant IS tools & methodologies)

The multiplicity of variables impinging on the operations of the MGOs can be placed in context by reference to Table 6.6. The earlier Table 4.22 was formulated from the survey findings in Phase One of the research work. Through the application of Multiple Perspectives, Table 6.6 proposed the framework which attempts to analyse the issues raised in Table 4.22. Diagramatically the process involved is presented in Figure 6.9.

Since one of the objectives of this thesis is to understand the CBIS implementation process from the senior executives' and IS practitioners' perspectives, the scope of the study covers only the upper quadrant (Problem Recognition Phase) of the diagram in Figure 6.9. The lower quadrant (Strategy Phase) deals mainly with the technical solutions, which were guided by the strategies formulated from the outcome of the findings in the upper quadrant.

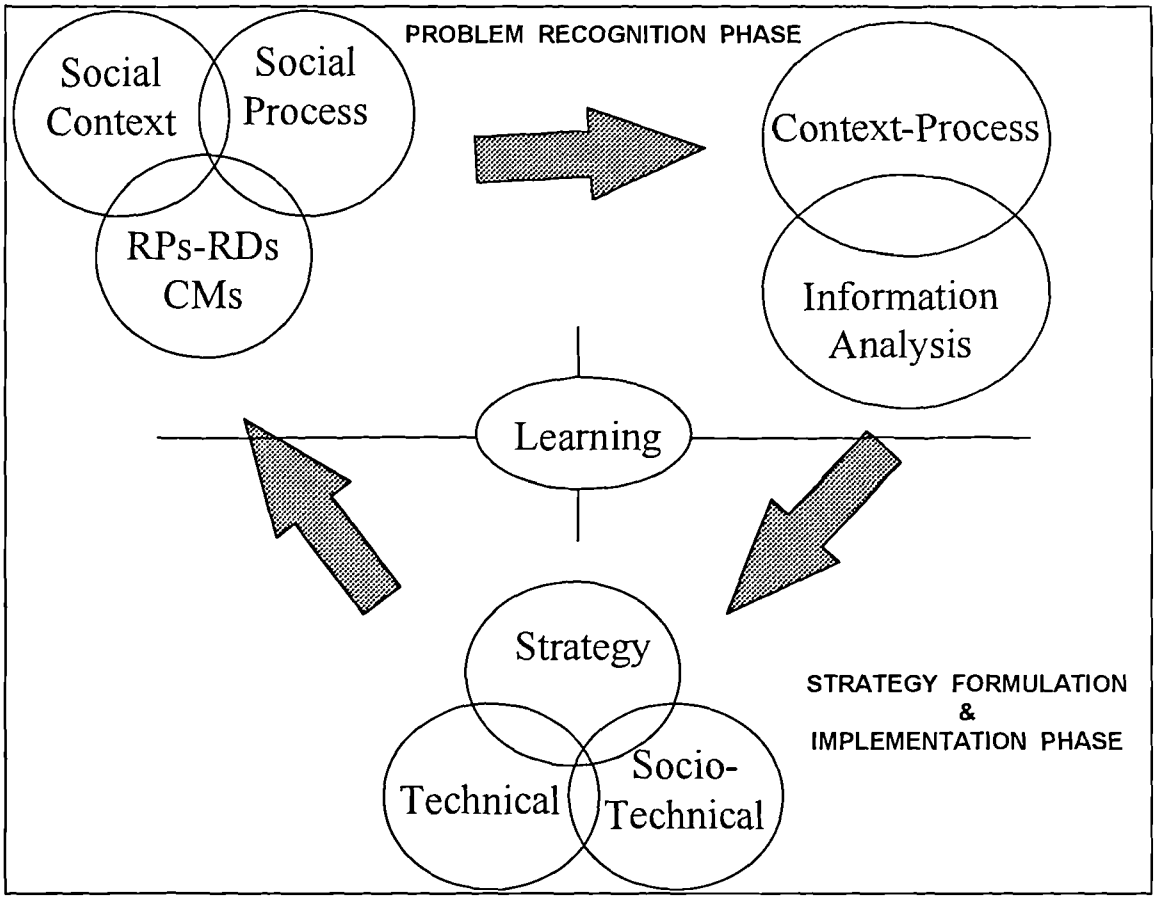

Figure 6.9: Multiple Perspectives Analysis of CBIS Implementation

Such an analysis can be used as a prerequisite for *planning, design, and action* in situations that involve human activity, and particularly in larger organisations involved in the processes of technological change and adaptation to new work practices.

A broader understanding of the social processes that impinge on the organisation helps in explaining historical events and in providing better understanding of the present situation, as well as the likely trend of events in the future.

By identifying the key variables, it is possible to exert more influence over future events and reduce the effects of disturbance from unexpected occurrences. Because MGOs are characterised by conflict, there is a need for management

involvement in modelling the subcultures towards co-operative activity. The leader is a model and a large amount of learning in organisations takes place through modelling. Leaders cannot avoid the role of model and such roles demand self-analysis and organisational analysis concerning the forms of behaviour, attitudes and values that are being represented. If leaders are seen as effective then these forms of behaviour and values will be initiated, if ineffective they will be shunned.

By adopting a co-operative role, senior executives can replace the fragmented interpretative schemes within the organisation with more coherent conceptual models from which a consensus of ideas, forms of behaviour, and work practices can be developed across the subcultures. Senior executives can multiply their role play through the appointment of managers who understand the importance of directed role behaviour and who are acceptable to the various subcultures under his influence or those with which he is likely to become involved.

Effective leadership can create a climate conducive to growth by placing emphasis on consultation, teamwork, participation, and involvement. There is a need for the qualities of imagination and vision, motivation towards this vision, an understanding of technical and social factors, co-operative interactions, and the capacity to communicate the vision to the staff. Recognition and reward for individual and group achievements are a way of reinforcing new patterns of behaviour among stakeholders.

Also involved are the communication and development of a clear vision of the task itself, so that a consensus of purpose develops within each subculture. At the same time, there needs to be flexibility, which allows groups and group representatives to influence that vision, so that they are committed to it. In line with this, there needs to be clearer role definitions, which must include an allowance of time for an individual to produce results rather than moving staff or managers in and out of departments and

job roles before results can be realistically achieved. Initially in situations involving changes in cultural climate, a sense of stability is required, but ultimately people can become responsible, motivated, and capable of governing themselves.

The role of the IS practitioner needs to be expanded to include a recognition of human activity systems. Along with the role of technical expert, the IS practitioner needs to focus on other role-plays relevance to the situation encountered. Rigidity of technical application to systems involving human activities and entrenched cultural perspectives may only reinforce the level of conflict between stakeholders. The IS practitioner needs to recognise that he or she is not only acting the role of technical expert, but also as a catalyst for change in the social processes that exist and those that are involved in technological change. As an agent for social progress, the IS practitioner also needs to act as a facilitator of these changes.

As an agent for social change, the analyst may need to spend more time in this role than in actual technical work, where there are situations involving high levels of disagreement, obstruction, and conflict. Even where the analyst judges that rapid systems development can take place, he needs to include co-operative agreements and human activity analysis in the overall design, planning, and implementation processes in order to maximise the potential contributions of stakeholders and to provide the dual objectives of meeting the organisation's processing requirements and providing new systems of shared meaning.

The analyst needs to involve all relevant groups within a framework of initial explorations and consultations, with the aim of producing a consensus of objectives, activities and responsibilities. This needs to be done in writing, in language, and action - since meaning changes with context so that there is also a need for written agreement. In linguistic practice, stakeholders assume that their understanding of a

particular situation is shared by other stakeholders. In the first instance, there needs to be a single written statement of objectives that can be agreed by different stakeholders.

Senior executives need to recognise and support such co-operatives' contracts and empower managers to ensure their ethical implementation. Organisational goals, which are meaningful to senior executives and worthy of commitment, may not seem so meaningful to stakeholders lower down in the hierarchy. Lower levels of the hierarchy need to be empowered and encouraged to feel involved through identification and internalisation of organisational objectives, and they need to experience self-development through personal contributions to these objectives.

Stakeholders need to be encouraged to adopt a "learning in action" attitude towards systems implementations. This is particularly important for the analyst whose interpretative scheme may include excessive reductionist thinking, which may be viewed as narrow dogma by other parties. As a facilitator, the analysts need to provide a sense of meaning that is significant to the other participants.

6.3 Chapter Summary

Phase 2 of the research work involved case study analysis using multilevel analysis and multiview methodology to investigate the effectiveness of CBIS implementations in Malaysian government organisations. Emphasis was placed on the worldviews of senior executives and IS practitioners, the resulting behavioural characteristics, and the impact of their behavioural tendencies on CBIS implementation process and outcomes.

It was observed that while senior executives are in a position to make positive contributions to the outcome of CBIS project implementations, they are restrained by their own worldviews. It was also observed that there is a general lack of awareness of

socio-technical issues by senior executives, and by stakeholders in general. Stakeholders are defensive about their own roles, status, and knowledgeability and rationalise their "fear of the unknown" in terms of *structural procedures and traditional* cultural roles.

Senior executives have implemented formal IT structures, steering committees, and working groups but have failed to address the underlying issues even at the minimal level of applying political leverage during CBIS implementation processes. Personal initiatives by individual stakeholders at lower levels of the hierarchy have been either stifled or extinguished by the weight of the consensus view, which is that to become involved in technology initiatives is time-consuming, technically overpowering, and politically risky.

The lack of success in IT development in Malaysian government organisations is traced to the worldviews of senior executives. It was also found that the worldview of the IS practitioner is lacking in an appreciation of sociological factors influencing project implementations and a lack of awareness in formulating the correct responses.

It was concluded that the lack of success in IT development in Malaysian government organisations can be traced to the worldviews of the two main agents in the socio-technical process of change - the senior executive and IS practitioner. This descriptive analysis based on case study investigations fulfils the second objective of the research, which was to determine the worldviews of senior executives and IS practitioners and to understand how and in what way these views impacted on the outcome of CBIS projects.

It was also observed that the IS practitioner is faced with the dilemma of working towards technical solutions to organisational problems in areas of government that are reluctant to become involve, and where there is no incentive or effective

managerial pressures to encourage their active participation. The IS practitioner has evolved subtle strategies and work practices to protect his own position, which may not be in the longer term interests of good working practices nor in making effective contributions to the organisation as a whole.

The conclusion is that such work practices and standards are unsatisfactory in relation to the contributions that could be made if the plight of the IS practitioner was correctly identified by senior executives. It was concluded that different aspects of leadership style have different effects on the perceptions, work practices, and actions of IS practitioners. The extent of the influence on the perceptions of IS practitioners can be described in qualitative terms as a lack of job satisfaction, uncertainty with respect to career prospects, poor morale, and even open hostility in cases of political appointments to key IT positions. The statistical analysis in Phase One of the research work also give weightings of factors and indications of extent in the impact of the various factors considered in relation to senior executive's worldview and its impact on the perceptions of other stakeholders. In this way, the second and third objectives of the research were met. The second and third objectives were to understand how, in what way, and to what extent the perspectives of senior executives influenced CBIS processes.

The fourth objective of the research work was to use the analyses, observations, and results of the research work to make recommendations and formulations that contribute to successful approaches to CBIS implementation processes. Although the main thrust of the research work was towards establishing formulations about leadership factors, other important behavioural dynamics were observed during the research work. Taken as a whole, the results and observations of the overall research processes were used to formulate prescriptive guidelines which can be adopted and used as catalytic components that enhance the effectiveness of traditional CBIS implementation strategies.

7 Summary and Conclusions

In this chapter the research findings are reviewed in relation to the objectives of the research work. Based on this, the implications for the management and application of technological implementations to meet the diverse requirements of organisational needs and human aspiration are discussed. At the same time the implications that relate to the theory and practice of this type of research work are deliberated.

The theoretical framework discussed in Chapter 2 was used to guide the analyses of the case studies. The theoretical framework discussed in Chapter 2 combines various knowledge concerns that are appropriate to this type of research work, and also to the explicit objectives of this research study. Specifically, the knowledge concerns that have been integrated into the multiple perspectives (multilevel analysis and multiview methodology) were considered appropriate to the nature and objectives of this research work.

Consequentially, the multiview methodology and multilevel analysis were integrated into the theoretical framework that was adopted and used to guide the research steps and approaches used to gain understanding and insights into the problem situation. The practical application of the theoretical framework is undertaken in relation to the interpretation of the discrete observations made during the case study work, in order to make sense and meaning from the observations. The process of applying theory in practice to produce meaning is the subject of Chapter 6 and provided an interpretative understanding of the problem situation.

The case study work is described in Chapter 5. The objective of the case study work was to examine the problem situation in breadth and depth in an objective and non-political manner. The lack of success of IT implementations within Malaysian government organisations is the major component of the observable problem situation. This problem situation is recognised by different levels of Malaysian government organisations. As a result, a longitudinal analysis was undertaken of the evolution of the MGO's since technological inception. The current status is examined within the macro context of MGO's. In parallel with this, micro-level case studies involving a longitudinal analysis and current status of specific projects were undertaken. The objective was to examine the problem situation in breadth and depth and produce a descriptive interpretation of the interactions that were taking place. Particular emphasis was placed on context-process linkage in relation to governmental and management strategies, stakeholder perceptions and outcomes in relation to CBIS implementations.

The case study work described in Chapter 5 represents a contribution to a descriptive understanding of the problem situation within Malaysian government organisations in terms of hierarchical breadth and depth, and context-process linkage. However, criticism has been made of the case study approach, and knowledge concerns have been expressed in relation to such approaches. Consequentially, the theoretical framework discussed in Chapter 2 was used to guide further analyses of the

case study material. The application of the theoretical framework to the case study problem situations is described in Chapter 6.

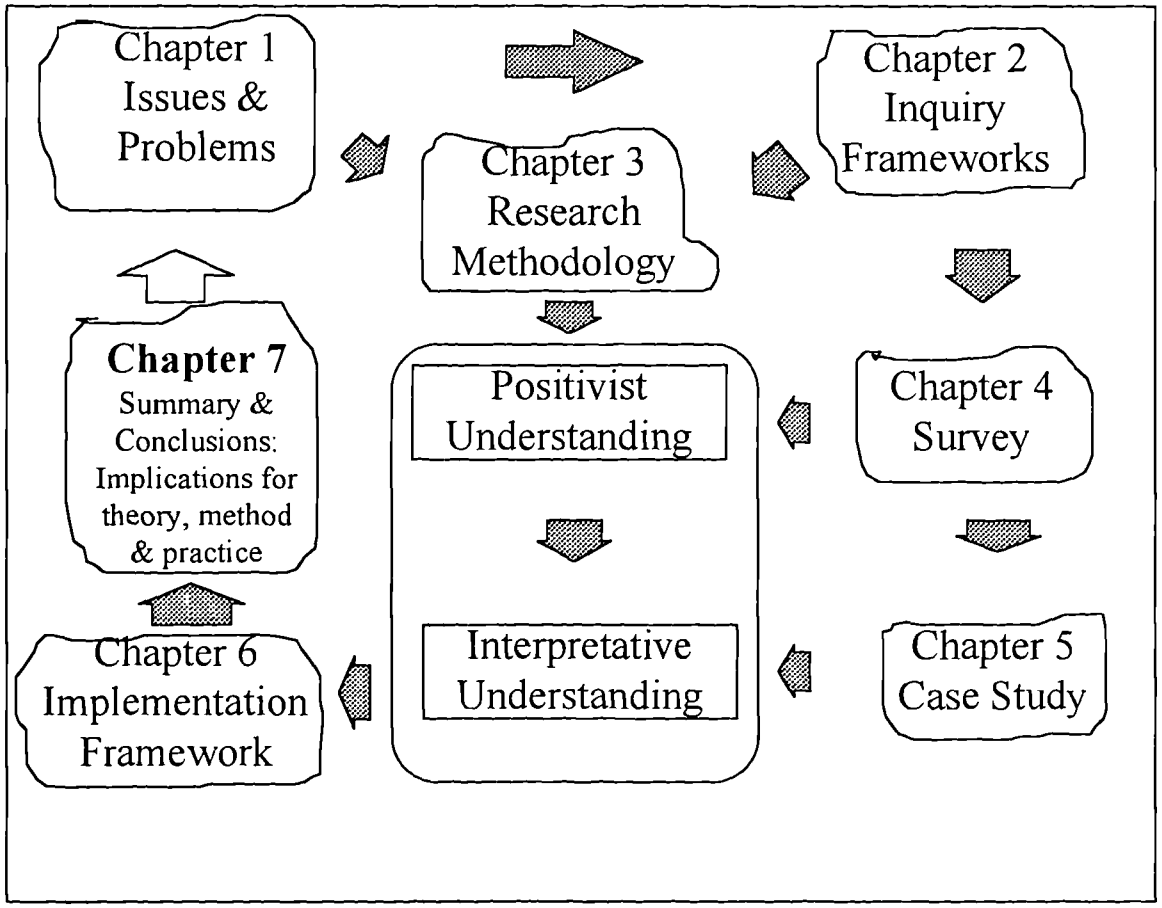

Figure 7.1: Chapter 7 Research Processes

In this chapter, the results of the questionnaire survey analysis and case study analysis are used to reflect upon the implications for enhancing the traditional approaches to strategy designs, implementation procedures, and work practices involved in the implementation of major CBIS projects. The chapter concludes by a consideration of the implications of this research work, its contribution to practical IS implementation strategies and to the development and use of theoretical frameworks in this type of research study. The introduction of technology initiatives in large organisations can have a dual effect on the structure, either in promoting organisational cohesion or tending to create fragmentation and conflict. The management of such initiatives is the main concern of this research study. Insufficient emphasis has been

placed on this specific context in the field of IS research, and suggestions are made for further research work in the management of socio-technical processes in large organisations that have made a substantial but unrewarding commitment to technology initiatives.

7.1 Review of Major Research Findings

This thesis has examined the processes of IS implementation in Malaysian government organisations. The research findings indicate that the development of CBIS in this sector (reviewed by Wilcocks and Harrow, 1992) is influenced by a variety of factors, which IS practitioners[18] perceive as being beyond their control. The findings also indicate that IS practitioners do not take into account critical factors that influence the process of IS implementation and contribute to the level of success or failure of a particular project. Senior executives adopt a traditional management role, while IS practitioners focus on technical issues.

Observations made during the research fieldwork highlighted the conflicting perspectives of different stakeholders, who, without exception, held to the roles they perceived to be relevant to their position and status within the hierarchy. A major problem exists in Malaysia in that there is no integrated CBIS implementation strategy at the current time. Stakeholders become involved in CBIS implementation processes by default, or on an ad hoc basis, or by initiatives related to their own interests in their own particular spheres of operation.

The two main agencies that influence CBIS implementations are Malaysian Management Modernisation Unit (MAMPU) and Public Service Department (PSD),

---

[18] The same argument has also been highlighted by Bjorn-Andersen and Cavaye (1994). They argue that IS practitioners usually lack the political pull to direct and implement organisational strategy

but these are concerned with, and focus on, administrative matters. MAMPU is responsible for the co-ordination and control of computing resources throughout the governmental organisation, but limits its sphere of influence by documenting and distributing guidelines. It also makes representations at ad hoc working committee meetings, receives input from other attendees, and issues further guidelines. MAMPU does not perceive its role to include providing direct intervention in the activities of operating agencies.

PSD has the responsibility for staff placements and training of IS professionals in various government agencies throughout the hierarchy. Traditionally the PSD hierarchy is itself dominated by administrative staff who perceive IT management as an administrative function and have a tendency to appoint non-technical managers to senior and middle management IT positions. They further perceive IS practitioners as narrowly focused on technical issues that make little real contribution to the activities of the organisation as a whole. Thus, they often end up not placing the right IS professionals with the right skill to do the job.

At the operational level, the operating agencies have experienced substantial problems over the ten-year period to date, during which the introduction of technologically based IS has cut across multiple stakeholders both horizontally and vertically in the government hierarchy. Problems have arisen on account of the diversity of requirements and the interests of the different stakeholders at the various levels. Their implementation difficulties have been compounded by what to them at least is a lack of adequate resources and political leverage accorded to them. During this time, CBIS implementations have been carried out in a piecemeal fashion based on ad hoc practices in an environment of confusion or disinterest. Existing social structures were largely reproduced as stakeholders tried to strengthen their position and bargaining power. No action was taken by senior executives for providing

adequate resources or the political leverage and sense of direction that might promote some shared structure of meaning among the different interests.

The analysis of the research data indicates that the different stakeholders within IT functions and those within the operating agencies perceive the failure of CBIS implementations to be related to the lack of involvement of senior executives at all stages of the implementations. The failure of CBIS projects over a ten-year period indicates that the problems are generic and represent a serious situation in the management of CBIS implementations in Malaysian government organisations. The problem situation is exacerbated by the distribution of mechanistic implementation guidelines by MAMPU and by PSD's appointment of non-technical staff to manage the IS practitioners' careers and training.

The findings from the research work indicate the need for positive intervention in these processes by senior executives. The problem is one of organisational design with a focus on CBIS implementations, and a methodological framework that can encompass the wide variety of factors that are involved in such implementations. It is proposed that Malaysian government organisations adopt a multiple perspectives framework for both organisational designs and for CBIS implementations. Such a framework would encompass the factors identified in the survey and case studies. Therefore, it is believed that the adoption of this framework will increase the capability of the various stakeholders responsible to control CBIS projects and guide them towards outcomes that are in line with their original intentions. To assist in this, the framework provides mechanisms for accountability both for senior executives and for IS practitioners.

In order to synthesise the research findings, the overall findings have been grouped into three broad categories. These are in the form of conclusions and relate to

the processes identified during CBIS implementations in Malaysian government organisations. The conclusions are related to the areas of:

- CBIS Strategy and Direction
- CBIS Implementation Process
- CBIS Implementation Status

Following these discussions, the approaches used during the research work are reviewed on theory, methodology, and practice. Because the work described in this thesis suggests some useful practical guidelines for senior executives and IS practitioners, these guidelines are discussed in the review of system practices. Suggestions are made for future research work in the field of IS, before the final conclusions are presented at the end of this chapter.

7.1.1 CBIS Strategy and Direction

First, strategy and direction for computerisation within MGOs are a function of the trend of management thinking. The leadership style that has evolved is characterised by Task Master styles and domination, rather than by paternalistic, consultative, and participative styles. The trend of management thinking has created a modelling effect throughout the MGOs and norms that reflect formal structures, with a lack of attention to factors involving human activity and the need for co-operative action between subcultures. The roles of the various stakeholders are not clearly defined except at a formal level. The expectations for successful project implementation have not materialised. Role expectation is a key element in role definition. Stakeholders' expectations create informal role definitions and role ambiguity. There is a general lack of a consensus view on project implementations. The different stakeholders are unaware of or unwilling to adopt the variety of roles that are required for successful CBIS outcomes. The actual roles adopted by the different

groups of stakeholders are based around the historical evolution of authority, personal interest, and compartmentalisation of activities.

Management has failed to influence cultural climates, to alter values, and to provide balanced forms of behaviour, expectations, and role activities. There are, as a result, role conflict, role overload or underload creating individual tensions, low morale, poor communications, and a lack of objective results. Stakeholders have adopted and evolved their own group interpretative schemes and levels of signification, so that those they operate by do not relate to others' schemes nor to the organisation's objectives of efficient use of public resources. The different levels of signification arrived at by the stakeholders through the evolution of their own interpretative schemes have created fragmentation of views and forms of behaviour that are detrimental to CBIS developments. This process of fragmentation of viewpoints is likely to continue and reinforce itself through group norms until there is appropriate intervention and action on the social structure by senior management.

Strategy and direction, as historically and currently implemented, can only produce results through the individual initiatives of stakeholders. While strategy and direction are clearly and formally defined, the implementation is more dependent on chance events and the co-operation of individuals and their personal initiatives and actions to improve the situation.

7.1.2 CBIS Implementation Process

Second, the implementation of CBIS projects within MGOs is characterised by coping mechanisms such as repression, withdrawals, rationalisations, and unilateral strategies rather than by co-operative planning and actions. IS practitioners feel a sense of role overload in that they are being made to feel personally responsible for all aspects of project planning and implementation.

There are no incentives for users to participate in implementations, so that they feel they have been given no effective role to play in the processes of technological change. Senior executives expect compliance within given timescales on project implementations and are able to call on domination to enforce compliance. Formal rules, procedures, and sanctions are used to legitimise Task Master leadership styles. Compliance depends on the influence of domination by senior executives. IS practitioners and users comply but do not personally identify with the implementation programmes nor with the initiator of the influence.

Subcultures within MGOs have no sense of internalisation of CBIS processes. Individuals need to feel a part of the process so that they can internalise the process of change in the sense that it becomes, to some extent, a personal possession of the individual involved in the process. Senior management needs to influence the interpretative schemes of the participants so that they are better able to understand the benefits of computerisation. They should in addition provide enhanced interpretative schemes that create a sense of individual meaning, and systems that have the perceived characteristics of shared meaning among the groups involved.

7.1.3 CBIS Implementation Status

Third, in implementation status, stakeholders view CBIS implementations as objective technical exercises rather than as group learning processes. Co-ordination of activities involves groups' representation, negotiation, and high levels of participation and contributions. Changes involve learning, and learning can only effectively take place during the implementation. Feedback is required and a process of listening and upwards communication is needed to highlight problems or opportunities that arise during or following the implementation. Discussion and agreement on role expectation need to take place, and these should also provide the opportunity to identify learning

needs that may be required to maintain involvement in implementations and to highlight what is relevant during the process.

Task Master dominated organisations and groups that have adopted the authoritarian style of the senior management interpretative schemes and organisational norms are less able to learn another mode of interaction. Group representatives cannot always fully accept critical feedback about the behaviour of their group. The introduction of technology into organisations requires a high level of adaptability, and substantial changes to work practices and learning skills. The traditional thinking involving the concept of compartmentalisation of activities can be carried over into new work practices so as to contaminate them.

Monitoring of activities can be seen as intrusive and demeaning. The onset of problems during implementations can be viewed as a lack of control and poor planning, rather than as a natural component of the learning processes. Co-ordination and monitoring require the introduction of group consultation and ethical arbitration on work and task responsibilities. Stakeholders need to make their expectations clear in the form of an agreement, and they should accept ethical management arbitration during the process of co-ordination, as well as monitoring and feedback to create new modalities through which the MGOs can function more proficiently in the process of technological change.

7.2 Research Reflections

The research findings in this thesis give rise to several reflections that relate to theory, methodology, and practice. The research has illustrated the value of the multiple perspectives approach using Multilevel analysis and Multiview methodology

in the empirical, theoretical, and practical analysis of the government CBIS implementation process.

7.2.1 Reflections on Theory

The multiple perspectives framework provides for new directions in the study of organisational phenomena, within a unified and cohesive framework. It provides for both research into organisational theory, and the development of frameworks for practical implementations and interventions in organisational processes. Traditional theories and models have lacked cohesion in that they have tended to focus on CBIS implementation strategies as macro-level issues, and have not provided adequate links, or explanations of the links, between implementation strategies and the development and use of CBIS in organisational activities.

The use of multiple perspectives analysis provides a broader scope and more sophistication in understanding context, process, and their linkage. Implementation strategy can be examined and its effects can be analysed and understood in connection with communication of meanings, the exercise of power, and the application of sanctions. In particular, in large governmental organisations, multiple perspectives recognises IT strategy as a multiple-level phenomenon influenced by the level of participation and involvement of executives at the highest levels of the hierarchy and technological sub-cultural perceptions. The effects of these Multilevel phenomena and dynamics exert both short-term and longer-term influences on the development of IT and its use in these organisations. By using the multiple perspectives framework, as a meta-theory, traditional approaches to government CBIS implementation strategy, as a macro-level phenomenon and its development and uses as a micro-level phenomenon, can be located and interpreted. The multiple perspectives approaches have also been noted by Avison and Wood-Harper (1991), Bell and Wood-Harper (1992), Vidgen *et al.* (1994) and Wood *et al.* (1994).

The use of Multilevel analysis within the multiple perspectives framework enables propositions to be established and examined so as to gain a deeper awareness of the mutual unfolding of the two-way link between action and structure, and the processes that are taking place and which produce either integration or fragmentation of organisational components. The general direction of the organisation's development can be observed, and action can be initiated in the form of a dialectical learning process by which social structures can be reinforced or changed. Through this process, the experiences of the various actors in the implementation can be monitored and assessed to provide an enhanced IS for senior management, by which a more effective and co-operative use of resources can be made.

Although implementation monitoring is likely to provide the bulk of experiences by which actors can evolve shared systems of meaning, such systems can be subjected to further analysis using Multiview methodology in order to enhance strategy decisions. In this sense, Multiview analysis is unlikely to provide absolute knowledge or solutions before project implementation take place, but it does provide an analytical framework that can accept the social skills, social awareness, and knowledgeability of the appropriate stakeholders, and so it is able to enhance the probability of success in IT implementations.

On this basis, and through the application of multiple perspectives analysis to the case studies, the apparently successful outcome of CBIS implementation processes is directly related to the ability of knowledgeable actors to mobilise contextual elements towards an integrated system of technological subcultures that share meanings, vision, values, and resources.

7.2.2 Reflections on Methodology

The research analyses in this thesis demonstrate the value of a methodology that advocates a multiple perspectives approach to organisational analysis. Such an approach highlights the importance of the interconnections of context and process, and the implications of stakeholders' perspectives in determining the success or failure of CBIS implementation projects. The methodology and the conclusions drawn in this research work emphasise the importance of tracing the changes in contexts over time and the nature of organisational processes and evolution. Context-process linkage is a dynamic that also changes over a period of time, as does the stakeholders' worldview, and the dynamics of change need to be studied through time to determine the evolutionary trends that have given rise to the current situation. By these means, relevant themes and hypotheses can be identified, further examined, and tested.

However, the structuration of government CBIS implementation processes is protracted in time and space. A retrospective orientation and historical reconstruction combined with elements of longitudinality was, therefore, not adopted as this was regarded as impractical within the time limits of the research programme. However, the need for longitudinal studies in research work involving government CBIS implementation processes cannot be overemphasised. The same principle applies to the social analysis of IS in general, with the aim of better understanding the interconnection between context and process across temporal boundaries. Examples of this are the two case studies where rich descriptions were developed through intensive fieldwork that explored changes in government CBIS implementation processes over timescales ranging from ten to twenty years. The two cases could be compared to produce additional insights into CBIS implementation processes, as, for example, in the comparison of differences in contextual norms that might account for differences in processes.

The methodology used also highlighted the value of using multiple methods in IS research, combining qualitative and quantitative methods of collecting, and analysing data. From a qualitative interpretivist point of view, this study relies heavily on actors' accounts of their experiences and interpretations of events. In so far as individuals replied cautiously in many cases and imparted information selectively, the findings can be misleading. This could be remedied to some extent by relying more on participants' observations and documentary evidence by which intentions and impressions could be weighed and judgements made, and formulated hypotheses which could be further investigated and tested using different pointers from different sources. In this way two variables that are suspected of being related may well be found to relate or, at least, have some association that has validity is and worthy of further investigation.

An example of this can be demonstrated using the computerisation profile in Chapter 5. In Malaysia, the government has taken on the responsibility to promote the nation as a whole as an information-rich society. However, outside the government's direct sphere of influence, i.e. in the private sector, actual data on the effectiveness of this policy is difficult to acquire. Statistical samples may nevertheless be taken and compared with the government's spending profile shown in Chapter 5. Within the limits of calculable confidence levels, the success or failure of government policy, in stimulating CBIS implementations in the private sector, can be gauged. If private investment is below government expectations, a policy of incentives might be appropriate to stimulate CBIS activity in an area of crucial importance to current trends in government strategy.

An example of how methodologies including both qualitative and quantitative approaches is included in the statistical analysis of organisational factors in Chapter 4. The indication of this example are that management roles were related directly to the level of success of CBIS implementations. This might be accepted as a hypothesis and

further researched to develop a thick description of senior executives involved in managing IT, their experiences, levels of awareness and involvement, and outcome for successful implementations. By sampling senior executives in this way, it may be concluded that a lack of awareness of socio-technological issues is a generic factor, rather than the lack of political will towards promoting successful CBIS implementations.

Although research methodology was limited in this research work to two case studies and both within Malaysian government organisations, the broad implication is that the importance of multiple perspectives, and the approaches adopted in this research work can be applied to other organisations or other countries (Yin 1989, 1993). The framework is flexible enough to be adapted to other types of organisation and other types of culture, which is undoubtedly a strong feature of the methodology used and its broader implications. Along with this, the research work has provided some insights into the form of prescriptive guidelines that might be relevant in a broader context. These insights do not represent absolute, codified rules and practices, but demonstrate that what has emerged from the research methodologies may be adopted within the context of Malaysian government organisations. These prescriptive guidelines may or may not be applicable, at varying levels, to other researchers working in different environments in different countries. These guidelines are discussed in the following section.

7.2.3 Reflections on Practice

Multilevel analysis provides for new observations on organisational strategies, implementations, and processes. Such observations can be used to examine traditional organisational thinking and designs, and to provide contributions to organisational theory in general.

The organisational theorist must be cautions in the application of Multilevel analysis, in that he must be critically self-conscious that his observations are both non-political and unprejudiced. The strength of multiple perspectives analysis is in its scope and flexibility. It provides broad frameworks, which allow an examination of a wide range of issues that might be relevant to the adoption of appropriate strategies, implementations, and processes. The result and value of his interventions will relate to the level of dedication and skill applied during an ethical analysis and interpretation of problem situations.

Because of the momentum of traditional thinking in organisational strategies towards convergent solutions, multiple perspectives analysis itself may be in danger of becoming recognised by the analyst as a panacea for issues involving organisational thinking, analysis, design, and implementation. This is particularly the case when aspects of multiple perspectives framework may be regarded as most helpful in providing appropriate intervention in one particular cultural context. Emphasis on useful insights into organisational phenomena in one culture might provide the wrong emphasis if applied to similar organisations operating in an entirely different cultural context. Despite these reflections, there is no reason to suppose that theories cannot be established or that designs cannot be made and applied in context to promote enhanced organisational designs and strategy implementations.

Implicit within the process of analysis of traditional forms of organisational behaviour and power structures is the need for the analyst to work to minimise conflict that may arise from his own approach, analyses, and interventions. The ability of the analyst to establish co-operative agreements at different levels of the hierarchy will also determine the result and effectiveness of the multiple perspectives approach. Ultimately, however, senior executives are responsible for the process of CBIS implementations, and for ensuring that the appropriate issues are highlighted and acted

on in a manner that optimises the use of the organisations' resources and provides for the longer-term development of these resources.

The work described in this thesis provides usual practical and prescriptive guidance for senior executives and IS practitioners working within the context of Malaysian government organisations. Firstly, IS practitioners must bear in mind that most senior executives in government organisations act as general managers, whose backgrounds lie in the elite areas of the government administration of the Malaysian Diplomatic and Administrative Service. Traditionally, they have only been involved in fringe activities relating to IT matters and have a lack of knowledge of technology issues. Because of their backgrounds in political and administrative areas, they are not adept at applying management solutions to areas involving high levels of technical complexity that can have far-reaching effects on work practices within Malaysian government organisations. The focus was on the exercise of political responsibility and Task Master leadership, which gained approval from their senior colleagues.

The natural inclination of senior executives is based on their experiences, which have been carried over into IT management. These inclinations tend towards being sensitive to unstable, unpredictable, and political environments, and towards protocol with an external and upwards focus. IS practitioners are conditioned by training to assume their responsibilities cover shorter-term thinking with an internal focus involving variables that exist at departmental level. Their focus is on technical issues and they are less politically astute (Beath and Orlikowski, 1994),[19] expecting to achieve through the application of stepwise routines in a buffered, stable, and structured environment that is apolitical and minimises distraction.

[19] Beath and Orlikowski (1994) raise a question about the systematic practice among IS professionals of ignoring critical issues such as the distribution of power, authority, knowledge, and control among the participants in system development.

Communication problems are often caused through the interaction of stakeholders with dissimilar educational backgrounds and work experiences. Without cross-training (IS practitioners being trained in an awareness of management and inter-personal skills, and senior management being trained in an awareness of IT implementation issues), which would promote mutual understanding, successful CBIS implementations and developments are likely to be difficult to realise. Bjørn-Andersen and Cavaye (1994) further suggest that IS practitioners need to be hybrids, bridge-builders, and integrators. Boone (1995) also supports this idea by suggesting that IS departments need a "boundary person", who has a very thorough knowledge of the business and the organisation. The boundary person then works with top executives to diagnose business problems and produce business solutions.

The detailed prescriptions that might be applied to Malaysian government CBIS implementation processes and the roles of senior executives, IS practitioners, operating and central agencies were presented in Chapter 6. Even so, prescriptions do not always lead to cures and, in some cases, the prescriptions may be rejected as unpalatable. Direct approach with prescriptive guidance to senior executives is likely to be fraught with difficulties. Because the appointment of senior executives in government organisations is a political process rather than a selection issue taking into account suitability based on levels of IT awareness, the receptivity of such approaches depends on the qualities of appointees which can vary widely. Therefore, factors that stimulate their understanding of a problem situation in the organisation must be presented indirectly in a manner that they can understand with recommendations for action to which they, as senior executives, can relate. Being politically aware, senior executives should be able to readily grasp the issues of conflict between subcultures,

the need for political emphasis in certain areas, and the need to be seen to be involved in the CBIS implementation process (Earl and Feeny, 1995).[20]

Thus, strategically, a group consensus and participative contracts must also be agreed with middle managers in the organisation. Middle managers need to be exposed to the tools available that can help them identify and understand the problem situations, alternative proposals for solutions to problem situations, and a level of IT awareness appropriate to the type of solution adopted. Middle managers need to understand the overall plan, with its benefits to their departmental operations, and organisational development as a whole. Middle managers in government organisations also need more IT awareness, but early approaches with technical issues and technical systems designs are likely to lead to problems in communication and create the impression of outside interferences in departmental operations and structures.

For IS practitioners looking to another country's CBIS implementation strategy and evaluating it as a model, it is instructive to note that CBIS implementations in other countries with more experience in this area have not been achieved without difficulties within short timescales, and those decisional dynamics and the need to understand the human activity aspects of CBIS implementations have only recently become apparent. The IS practitioner can take advantage of these experiences by ensuring that a historical analysis of work practices, attitudes, and forms of behaviour constitutes an integral part of systems analysis. Bell (1992, 1994) has also suggested that IS practitioners should undertake self-analysis.[21] In this way the IS practitioner

---

[20] Earl and Feeny (1995) state that the information officers (IS practitioners) need to be part of the solution by adding value rather than part of the problem by consuming resources. They should join with the CEOs in focusing on the 20% of the requirements that deliver 80% of the product.

[21] Although the discussion of his paper (1994) revolves around technology transfers from developed countries to developing countries, two of the variables in Bell's model are indirectly related to the aspects of social and cultural conditioning, which are also the themes discussed throughout this thesis. The two variables are: methodology preference and pre-analysis, and the level of risk in the environment.

can understand the evolutionary trends leading to the current situation and root definitions. This is demonstrated in the case study analyses, which cover an extended period of historical and evolutionary investigations.

By talking to and interviewing key actors in the agency or agencies concerned with the implementation process, and by analysing historical records, it is possible to establish the underlying set of meanings and the broader contexts that influence those meanings, and which are likely to have an important impact on the implementation process. The different aspects of any organisational issue, including structures, processes, relationships, and tasks, can be represented pictorially in the form of rich pictures and root definitions determined. By these means, a group consensus can be formulated to provide optimal solutions to problem situations.

CBIS implementations utilise resources and facilities to implement the solutions, and an understanding of the types of resources and facilities available is needed. This requires analysis and information modelling through which the organisational mechanisms that enable or constrain the formulation, implementation, and monitoring of CBIS projects can be assessed. The Malaysian experiences, involving a succession of ad hoc committees with inadequate resources and facilities and a poor record of CBIS project successes, indicate the importance of ensuring that implementations are supported and able to draw on adequate resources and facilities to meet the requirement.

Finally, within the socio-technical approach, the norms and values that underpin the CBIS implementation, their broader cultural context and systems of values need to be considered, as these provide legitimation for the CBIS implementation in that particular organisation and determine the extent to which a shared vision can be developed by the various stakeholders. The development and successful implementation of large-scale systems are a consequence of shared vision and

understanding among the developers and users, facilitated by resources and power relationships. While the demonstrations of successful large-scale systems implementations, in countries with more experience in such implementations, excite the imagination, it is doubtful that these systems can be imported into the context of MGOs in an effective manner. Apparently major revisions in the existing structures of meanings, organisational and political relationships, values, and moral standards need to be made. Such changes cannot be made quickly and attempts to do so may lead to fragmentation of IT implementations within large organisations. Evidence of this exists within the MGOs, where various organisations have created their own IT divisions and functions with poor CBIS implementation performances. Even so, no significant improvements can be detected and implementations remain tactical, operational, and ineffective in their utilisation.

The results of the field research in this thesis indicate that CBIS is a Multilevel phenomenon and needs to be implemented not solely on the grounds of technical feasibility, but within the framework of a strategic corporate philosophy which recognises the social and cultural aspects of the implementations as being critical to their success.

7.2.4 Reflections of the Researcher

In this section, the researcher reflects on the perceptions he had before undertaking the research work and how these have been modified. Self-examination is an important aspect of this type of research before, during, and after the work. He understood the importance of maintaining both a non-political and unprejudiced attitude throughout the research work, and believed this to be possible. Unfortunately, this in itself gave him initial cause for concern since the researcher's main objective was to unify different areas of knowledge concerns. This necessitated the use of multiple frameworks and multiple approaches in collecting and analysing research data.

Different views and approaches were likely to provide a multitude of variables capable of different interpretation or emphasis. He felt the work would diverge indefinitely and never provide convergent themes from which conclusions could be drawn. The task of being involved in participative interviewing and data collection seemed daunting.

After some reflection on the subject of exploring complex and often politically diverse situations in an unbiased way, a thought struck him. He felt he could undertake the task provided he focused on a genuine curiosity in views held by different stakeholders. In fact, he had the answer all along, but had been overwhelmed by his own focus on words like "unbiased," "neutral," and "non-political." Genuine curiosity had brought him to undertake the research work in the first instance since fifteen years as an IT practitioner had convinced him that traditional IT practices did not exploit the full potential of the technology itself, nor did they contribute to the personal development of those involved. This had provided him with a genuine curiosity to establish why this was so. He decided not to draw any conclusions, or even attempt to form conclusions during data collection, but to simply explore, and explore again until he could "feel" the points of view of the different stakeholders. The question of analysis and forming conclusions then became a matter of compromise between the different perceptions of the different stakeholders and groups of stakeholders. This experience enabled him to understand how his background, training and work experiences had conditioned him to suppress his natural, and even strong, aspirations to explore alternative ways of habitual thinking and effective research approaches.

The researcher also came to understand that descriptive work has, or could have, validity and that convergent solutions could be derived from divergent investigations. He was able to adopt this theme as a way of thinking, and so make sense of competing theoretical frameworks and operationalise them. Even so, he experienced a tendency to slip back into drawing "hard" conclusions from time to time during the research and this, in itself, represented for him a major part of the learning

process. He has learned that conscious effort is needed to maintain a balanced approach to both "hard" and "soft" analysis. Despite his recognition of the value of the "soft" approach to "hard" sciences, he believes it needs reinforcing and practising. Should he return to work in an exclusively "hard" role, he would undoubtedly become conditioned to that type of role. He believes this demonstrates how values can be influenced by contextual settings.

Senior executives model their organisations in line with their particular value-systems, creating "hard" or "soft" or mixed contexts. He believes that they need to understand technology initiatives in the context of a learning process. In the same way, his own experience of this research work is that it has, for himself, been a learning process in that it has created a new set of values that he aspires to carry forward into his career as an IT practitioner.

7.3 Suggestions for Future Research

Mintzberg (1994) has suggested that successful strategy is often the outcome of intuitive and creative thinking using existing knowledge in new ways, finding new combinations, and seeing new perspectives. Strategy is often the result of a process of being exposed to information regarding problems and solutions and then making a match between a problem and a solution. This is what the suggested framework in Chapter 6 *(Figure 6.9: Multiple Perspectives Analysis of IS Implementation)* is trying to achieve.

The theoretical ideas of the IS implementation framework can be examined, clarified, and extended by practical application. Practical application provides new insights and a variety of meanings, which enhance the researcher's view of the framework itself and its potential contribution to the design of other frameworks.

The prescriptive framework discussed in this chapter could be used to devise specific guidelines or to contribute to new approaches in IS implementation procedures and practices. Such prescriptive guidelines could be used to elaborate on the human aspects of formal design methodologies. Training programmes could be developed and tailored to be meaningful to individuals or cultures who have different worldviews, educational backgrounds, and levels of responsibility.

The field of IS is a fast-moving one. Trends such as end-user computing, networking, and distributed processing mark a diffusion of computer skills and present interesting domains for further work. This might involve the application of the framework to a specific area. In the case of distributed processing, specifically designed monitoring processes may be required in the area of data handling, information reporting, and work practices at remote locations, which operate in different cultural climates. Clearly it may be a risk to invest even in the most sophisticated systems without a detailed analysis and design that is appropriate to cultural climates and work practices.

The theoretical apparatus developed in this research could be used as a starting point for an analysis of the area itself, with particular reference being made to social, political, and economic contexts. In this way, the framework can be directed towards macro-level organisational designs capable of handling processes involving change, or at the micro-level of systems design, particularly in critical areas of the organisation's activities, which may be remote and less influenced by central norms, behaviour patterns, and accepted work practices.

Such areas of research could be used to further elaborate on the theoretical basis of the integrative approach to IS and to increase the sophistication of an interpretivist understanding. The above suggestions are all based around the inter-

relationship of organisation, information, and communication - issues which are subtlety interrelated. The effects of these interrelationships can have a far-reaching impact on the outcome of the IS implementation process. It is with such interdependencies and outcomes that this research has been concerned, and further research in this area promises to be a fertile source of debate and insight.

7.4 Conclusion

This chapter has synthesised the empirical findings of the research and has derived some broad conclusions about theory, methodology, and practices relevant to IS implementation processes in government organisations. It is both a premise and a conclusion of this research that senior executives' leadership roles, IS practitioners' worldviews and the effectiveness of computerisation strategies are inextricably interwoven.

The insights gained from the research programme show that a better understanding of both senior executives' behaviour and IS implementation processes can be achieved by treating these factors as components of a multiple perspectives analysis. Analysis of stakeholders' behaviour during IS implementation processes, using the concept of duality of structure, points to the importance of the communication of meanings, resources and facilities, norms and values, and the central role of the actors in mediating between context and process.

It has been shown that IT strategies adopted by senior management can have unintended consequences by inhibiting positive action and personal initiatives at all levels, and by reproducing existing structures. The concept of interaction applied to an analysis of senior executives' behaviour and IS implementation, combined with the empirical evidence generated through the application of research practices, has yielded

new insights regarding IS implementation processes. It demonstrates how human activity and human resources can add worth and value in their own activities while realising organisational goals. Such insights into the concepts of behaviour and implementation process, which are pivoted on Multilevel analysis and Multiview methodology, illustrate the value of multiple perspectives as a meta-theory in IS research.

The analysis provided in this thesis is directed towards sensitising stakeholders to the importance of an understanding of the contributions of history, context, process, and the linkage of context and process in stakeholders' perspectives on the communication of meaning, the exercise of relations of power, and the making of value judgements. By adopting the appropriate methodologies and strategies, senior executives can empower stakeholders at all levels within the organisation to act, even in unfamiliar situations involving rapid innovation, challenge, re-orientation, and change.

The practical implications are that the actor, whether a senior executive or an IS practitioner, through being sensitised to the importance of the interlinkage of meanings, resources, and norms, can consciously operate on these "levers" and increase the chances of influencing the outcomes they desire for their organisations or themselves. Hopefully, this contribution will further advance the theory, methodology, and practice of IS implementations in modern organisations.

Whilst this chapter may represent the end of the thesis, the researcher considers this document to be the end of the beginning. Now is the time to take up the challenge of a career as a researcher into a subject area which does not seem to have received much attention in the past. This document represents the first, small step on the long road ahead.

References

Abdel-Khalek, A.R. and Ajinka, B.B. (1979) *'Empirical Research in Accounting: A Methodological Viewpoint'* American Accounting Association, Sarasota, Florida.

Abdullah, A. Rahman (1992) *'Improvement and Development in the Public Service 1992'* MAMPU, Prime Minister's Department, Malaysia.

Abdullah, A. Rahman (1993) *'Improvement and Development in the Public Service 1993'* MAMPU, Prime Minister's Department, Malaysia.

Alavi, M. and Joachimasthaler, E.A. (1992) 'Revisiting DSS Implementation Research: A Meta-analysis of the Literature and Suggestions for Research' *MIS Quarterly*, Vol. 16, pp. 95-113.

Ang, J. and Pavri, F. (1994) 'A Survey and Critique of the Impacts of Information Technology' *International Journal of Information Management*, Vol. 14, No. 2, pp. 122-133.

Antill, L. (1985) 'Selection of a Research Method' in *Mumford, E., Hirschheim, R., Fitzgerald, G. and Wood-Harper, T.* (Eds) 1985, pp. 203-218.

Atwell, P. and Rule, J. (1991) 'Survey and Other Methodologies Applied to IT Impact Research: Experience from a Comparative Study of Business Computing' in Kraemer, K.L. (Eds), *Harvard Business School Research Colloquium*, pp. 299-335.

Avison, D.E. and Fitzgerald, G. (1988) *'Information Systems Development: Methodologies, Techniques, and Tools'* Blackwell Scientific Publications, Oxford.

Avison, D.E. and Wood-Harper, A.T. (1990) *'Multiview: An Exploration in Information Systems Development'* Blackwell Scientific Publications, Oxford.

Avison, D.E. and Wood-Harper, A.T. (1991) 'Information Systems Development: An Exploration of Ideas in Practice'. *Computer Journal*, Vol. 34 (2), pp. 98-112.

Babbie, E. (1989) *'The Practice of Social Research'* (5th Edition), California, Wadsworth Publishing Company Inc.

Bansler, J. (1989) 'Systems Development Research in Scandinavia: Three Theoretical Schools' *Scandinavian Research in Information Systems*, Vol. 1, No. 1, pp. 3-20.

Barki, H. and Hartwick, J. (1989) 'Rethinking the Concept of User Involvement' *MIS Quarterly*, Vol. 13(1), pp. 53-64.

Barley, S.R. (1986) 'Technology as an Ocasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments' *Administrative Science Quarterly*, Vol. 31, No. 1, pp. 78-108.

Baronas, A. and Louis, M. (1988) 'Restoring a Sense of Control During Implementation: How user Involvement Leads to System Acceptance' *MIS Quarterly*, March, Vol. 12 (1), pp. 111-124.

Bartlett, C.A. and Ghosal, S. (1995) 'Changing the Role of Top Management: Beyond Systems to People' *Harvard Business Review*, May-June, pp. 132-142.

Beath, C.M. (1991) 'Supporting the Information Technology Champion' *MIS Quarterly*, September, Vol. 15 (3), pp. 355-372.

Beath, C.M. and Ives, B. (1988) 'The Information Technology Champion: Aiding and Aberting, Care and Feeding' *Proceedings of the 21st Annual Hawaii International Conference on Systems Sciences*, Vol. IV, Kailua-Kona, Hawaii, pp. 115-123.

Beath, C.M. and Orlikowski, W.J. (1994) 'The Contradictory Structure of Systems Development Methodologies: Deconstructing the IS-User Relationship in Information Engineering' *Information Systems Research*, Vol. 5, No. 4, pp. 350-377.

Beetham, D. (1987) *'Bureaucracy'* Open University Press, Milton Keynes.

Bell, S. (1992) 'Self-analysis and Pre-analysis: Lessons in the Application of System Analysis in Developing Countries' in Cyranek, G. and Bhatnagar, S.C. (Eds), 1992, *Technology Transfer for Development: The Prospects and Limits of Information Technology*, Tata McGraw Hill, New Delhi, pp. 151-164.

Bell, S. (1994) 'Methods and Mindsets: Towards an Understanding of the Tyranny of Methodology' *Public Administration and Development*, Vol. 14, No. 4, pp. 323-338.

Bell, S. and Wood-Harper, A.T. (1990) 'Information Systems Development for Developing Countries' in *Bhatnagar, S.C. and Bjorn-Andersen, N.* (Eds), 1990, pp. 23-39.

Bell, S. and Wood-Harper, A.T. (1992) *'Rapid Information Systems Development'* McGraw-Hill: London.

Benbasat, I., Goldstein, David K., Mead, Melissa. (1987) 'The Case Study Research Strategy in Studies of Information Systems' *MIS Quarterly*, Sept., pp. 369-386.

Bhatnagar, S.C. and Bjorn-Andersen, N. (1990) *'Information Technology in Developing Countries'* Elsevier Science Publishers B. V. North-Holland.

Bjørn-Andersen, N. (1989) 'An Epistemological and Ontological Classification of the Contributed Papers' in *Klein, H.K. and Kumar, K.* (Eds), 1989, pp. 299-310.

Bjørn-Andersen, N. and Cavaye, A. (1994) 'Re-engineering the Role of IS Professionals' in *Glasson et al.*, (Eds) 1994, pp. 17-26.

Blackler, F. (1988) 'Information Technologies and Organizations: Lessons from the 1980s and Issues for the 1990s' *Journal of Occupational Psychology*, Vol. 61, pp. 113-127.

Boone, M. (1995) 'Leadership and the Computer' *Investor's Business Daily*, 18 Sept.

Bourchard, T.J. (1976) 'Unobtrusive Measures: An Inventory of Uses' *Sociological Methods and Research*, Vol. 4, pp. 267-300.

Boland, R. (1985) *'Accounting and the Reproduction of Culture: Budgets and the Process of Structuration'* BEBR Faculty Working Paper 1168, College of Commerce and Business Administration, University of Illinois, Urbana-champaign (August).

Boland, R. (1989) 'Metaphorical Traps in Developing Information Systems for Human Progress' in *Klein, H.K. & Kumar, K.* (Eds) 1989, pp. 277-290.

Boland, R. and Day, W. (1982) 'The Process of System Design: A Phenomenological Approach' in Ginzberg, M and C. Ross (Eds), 1982, *Proceedings of the Third International Conference on Information Systems*, Ann Arbor, Michigan, pp. 31-45.

Boland, R. and R. Hirschheim (Eds), 1987 *'Critical Issues in Information Systems Research'* John Wiley and Sons.

Boland, R. and Wesley, D.F. (1989) 'The Experience of System Design; A Hermeneutic of Organizational Action' *Scandinavian Journal of Management*, Vol. 5, No. 2, pp. 87-104.

Braynt, C. and Jary, D. (Eds) (1990) *'Giddens' Theory of Structuration: A Critical Appreciation'* Routledge.

Brittain White, K. (1985) 'Perceptions and Deceptions: Issues for Information Systems Research' in *Mumford et al.*, (Eds) 1985, pp. 237-242.

Bryman, A. (1988) *'Quantity and Quality in Social Research'* London, Routledge.

Bryman, A and Cramer, D. (1990) *'Quantitative Data Analysis for Social Scientist'* London, Routledge.

Burell, G. and Morgan, G. (1979) *'Sociological Paradigms and Organizational Analysis'* Heinemann, London.

Burgess, R.G. (1984) *'In the Field'* London, Allen & Unwin.

Burns, T. and Stalker, G.M. (1961) *'The Management of Innovation'* Tavistock: London.

Campbell, D.T. and Fiske, D.W. (1959) 'Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix' *Psychological Bulletin*, Vol. 56, pp. 81-105.

Carroll, J.M. (1985) 'Satisfaction Conditions for Mental Models' *Contemporary Psychology*, Vol. 30, No. 9, p. 693-695.

Cash, J.I., McFarlan, F.W., McKenney, J.L. and Vitale, M.R. (1988) *'Corporate Information Systems Management: Text and Cases'* (2nd Edition), Irwin, Homewood, IL.

Cattell, R.B. (1965) 'Factor Analysis: An Introduction to Essentials' *Biometrics*, pp. 190-215.

Checkland, P.B. (1981) *'System Thinking Systems Practice'* John Wiley, Chichester.

Checkland, P.B. (1988) 'Information Systems and Systems Thinking: Time to Unite?' *International Journal of Information Management*, Vol. 8, No. 4, pp. 239-248.

Checkland, P.B. and Scholes, J. (1990) *'Soft Systems Methodology in Action'* John Wiley, Chichester.

Child, D. (1970) *'The Essentials of Factor Analysis'* London: Holt, Rinehart and Winston.

Child, J. (1972) 'Organisational Structure, Environment and Performance: The Role of Strategic Choice' *Sociology*, Vol. 6, No. 1, pp. 1-22.

Ciborra, C. (1987) 'Reframing the Role of Computers in Organizations - The Transaction Costs Approach' *Office, Technology and People*, Vol. 3, pp. 17-38.

Conger, J. and Kanungo, N. (1987) 'Toward a Behavioral Theory of Charismatic Leadership in Organizational Settings' *Academy of Management Review*, Vol. 12, pp. 637-647.

Counte, M.A., Kjerulff, K.H., Salloway, J.C. and Campbell, C. (1985) 'Implementing Computerization in Hospitals: A Case Study of the Behavioural and Attitudinal

Impacts of a Medical Information System' in *Computers, People and Productivity*, pp. 109-122. New York: Hawthorne Press Inc.

Craigh Smith, N. (1988) *'The Case Study: A Vital Yet Misunderstood Research Method for Management'* Paper Presented at the British Academy of Management Conference, Cardiff, September 1988.

Cronbach, L.J. (1951) 'Coefficient Alpha and the Internal Structure of Tests' *Psychometrika*, Vol. 16, pp. 297-334.

Daft, R., Sormunen, J., and Parks, D. (1988) 'Chief executive Scanning, Environmental Characteristics, and Company Performance: An Empirical Study' *Strategic Management Journal*, Vol. 9, pp. 123-139.

Danziger, J.N. (1985) 'Computerized Data-based Systems and Productivity Among Professional Workers: The Case of Detectives' *Public Administration Review,* Vol. 45, No. 1, pp. 196-209.

Danziger, J.N., and K.L. Kraemer. (1986) *'People and Computers: The Impacts of Computing on End Users in Organizations'* New York: Columbia University Press.

Davis, G.B., and Olson, M. (1985) *'Management Information System: Conceptual Foundations, Structure and Development'* (2nd Edition), McGraw Hill, New York.

Delone, W.H. and McLean, E.R. (1992) 'Information Systems Success: The Quest for the Dependent Variable' *Information Systems Research*, Vol. 3, No. 1, pp. 60-95.

de Vaus, D.A. (1993) *'Surveys in Social Research'* (3rd Edition), UCL Press Ltd. London.

Doll, W.J. (1985) 'Avenues for Top Management Involvement in Successful MIS Development' *MIS Quarterly*, March, Vol. 9 (1), pp. 17-35.

Drucker, P. (1967) *'The Effective Executive'* Heinemann, London.

Drucker, P. (1973) *'Management: Tasks, Responsibilities, Practices'* New York: Harper and Row.

Drucker, P. (1995) 'The Information Executives Truly Need' *Harvard Business Review*, January-February, pp. 54-62.

Earl, M.J. (1990) 'Approaches to Strategic Information Systems Planning: Experience in 21 UK companies' *Proceedings of the eleventh international conference on Information Systems*, Copenhagen, Denmark, pp. 271-277.

Earl, M. and Feeny, D. (1995) 'Is Your CIO Adding Value?' *The McKinsey Quarterly*, No. 2, p. 144.

Ein-Dor, P. and Segev, E. (1981) *'Paradigm for Management Information Systems'* Praeger Publishers. New York.

Ein-Dor, P. and Segev, E. (1988) 'Information Resources Management for End User Computing: An Exploratory Study' *Information Resources Management Journal*, Vol. 1(fall), pp. 36-49.

Falkenstine, D. (1991) 'Think Business Transformation' *Computerworld*, July, p. 80.

Feeny, D.F., Edwards, B.R., and Simpson, K.M. (1992) 'Understanding the CEO/CIO Relationship' *MIS Quarterly*, Vol. 16(4), pp. 435-448.

Fleck, J., Webster, J. and Williams, R. (1990) 'Dynamics of Information Technology Implementation' *Futures*, July/ August, pp. 618-640.

Fletcher, K. (1995) *'Marketing Management and Information Technology'* Prentice Hall International (UK) Ltd. p. 82.

Flood, R.L. and Jackson, M.C. (1991) *'Creative Problem Solving; Total Systems Intervention'* Willey, Chichester.

Franz, C.R. and Robey, D. (1987) 'Strategies for Research on Information Systems in Organisations: A Critical Analysis of Research Purpose and Time Frame', in *Boland, R. and R. Hirschheim* (Eds), 1987, pp. 205-225.

Frude, N (1987) *'A Guide to SPSS PC+'* MacMillan Education Ltd. UK.

Gable, G.G. (1994) 'Integrating Case Study and Survey Research Methods: An Example in Information Systems', *European Journal of Information Systems*, Vol. 3, No. 2, pp. 112-126.

Galliers, R.D. (1991a) 'Strategic Information Systems Planning: Myths, Reality and Guidelines for Successful Implementation' *European Journal Strategic Information Systems*, Vol. 1, pp. 50-56.

Galliers, R.D. (1991b) 'Choosing Appropriate Information Systems Research Approaches' in the *Proceedings of the IFIP WC on the IS Research Arenas of the 90s*, Copenhagen, 14-16 December 1990.

Galliers, R.D. (Ed), (1992) *'Information Systems Research - Issues, Methods and Practical Guidelines'* Blackwell, Oxford.

Galliers, R.D. (1993) 'Research Issues in Information Systems' *Journal of Information Technology*, Vol. 8, No. 2, pp. 92-98.

Galliers, R.D. (1994) 'Relevance and Rigour in Information Systems Research: some personal reflections on issues facing the Information Systems research community in *Glasson et al.*, (Eds), 1994, pp. 93-101.

Galliers, R.D. and Land, F.F. (1987) 'Choosing Appropriate Information Systems Research Methodologies' *Communications of the ACM*, Vol. 30, pp. 900-902.

Galliers, R.D., Klass, D.J., Levy, M. and Pattison, E. (1991) 'Effective Strategy Formulation Using Decision Conferencing and Soft Systems Methodology' in Stamper, R.K. *et al.*, (Eds), 1991, *Collaborative Work, Social Communications and Information Systems*, Elsevier, Amsterdam.

Geertz, C. (1973) *'The Interpretations of Cultures'* New York, Basic Books.

Giddens, A. (1976) *'New Rules in Sociological Methods: A Positive Critique of Interpretative Sociologies'* Hutchinson, London/ Basic Books, New York.

Giddens, A. (1979) *'Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis'* MacMillan, London/ University of California Press, Berkeley.

Giddens, A. (1984) *'The Constitution of Society: Outline of the Theory of Structuration'* Polity Press, Cambridge/ University of California Press, Berkeley.

Glaser, B.G. and Strauss, A.L. (1967) *'The Discovery of Grounded Theory: Strategies for Qualitative Research'* Weidenfeld & Nicholson: London.

Glasson *et al.*, (Eds) (1994) *'Business Process Re-Engineering: Information Systems Opportunities and Challenges'* Elsevier Science B.V. North-Holland.

Goodman, R. (1968) *'Teach Yourself Statistics'* The English University Press Ltd.

Gupta, A. and Govindarajan, V. (1984) 'Business Unit Strategy, Managerial Characteristics, and Business Unit Effectiveness at Strategy Implementation' *Academy of Management Journal*, Vol. 27, pp. 25-41.

Goldstein, D. (1986) 'Use of Qualitative Methods in MIS Research' *Proceedings of the Seventh International Conference on Information Systems*, Baltimore, MD: Association of Computing Machinery, pp. 338-339.

Govindarajan, V. (1989) 'Implementing Competitive Strategies at the Business Unit Level: Implications for Matching Managers and Strategies' *Strategic Management Journal*, Vol. 10, pp. 251-270.

Green, P.E. (1978) *'Analyzing Multivariate Data'* Hinsdale, Illinois: Dryden.

Habermas, J. (1984) *'The Theory of Communicative Action - Reason and the Rationalization of Society'*, Vol. 1, Beacon Press, Boston.

Hammersley, M. and Atkinson, P. (1983) *'Ethnography: Principles in Practice'* London, Tavistock.

Han, C.K. (1991) *'Information Technology Policies and Government Information Systems: A Multiple Level Perspective'* Unpublished Thesis, University of Cambridge, UK.

Hart, S.L. and Quinn, R.E. (1993) 'Roles Executives Play: CEOs, Behavioral Complexity, and Firm Performance' *Human Relations*, Vol. 46, No. 5, pp. 543-574.

Hempel, C.G. (1965) *'Aspects of Scientific Explanation'* New York: The Free Press.

Henderson, J.C. (1990) 'Plugging into Strategic Partnerships: The Critical IS Connection' *Sloan Management Review*, Vol. 31(3), pp. 7-18.

Hirschheim, R. (1985a) *'Office Automation: Concepts, Technologies and Issues'* Addison Wesley.

Hirschheim, R. (1985b) *'Office Automation: A Social and Organizational Perspective'* Wiley, Chichester.

Hirschheim, R. (1992) 'Information Systems Epistemology: An Historical Perspective' in *Galliers, R.D.* (Ed), 1992, pp. 28-60.

Hirschheim, R. and Klein, H. (1989) 'Four Paradigms of Information Systems Development' *Communications of the ACM*, Vol. 32, No. 10.

Hirschheim, R. and Smithson, S. (1987) 'Information Systems Evaluation: Myth and Reality' in Galliers, R.D. (Ed), 1987, *Information Analysis - Selected Readings*, Addison Wesley, Wokingham.

Hirschheim, R., Klein, H. and Newman, M. (1987) 'A Social Action Perspective of Information Systems development' in DeGross, J and Kriebel, C. (Eds), 1987, *Proceedings of the 8th ICIS Conference*, ACM, New York, pp. 45-56.

Hussain, A. Atory (1986) *'Pengantar Pentadbiran Awam'* Edisi Kemaskini, Utusan Publications, Kuala Lumpur.

'Information Malaysia 1995 Yearbook' (1995), Berita Publishing Sdn. Bhd. Kuala Lumpur.

Isenberg, D.J. (1984) 'How Senior Managers Think' *Harvard Business Review*, Nov.-Dec. , p. 82.

Ives, B. and Olsen, M.H. (1984) 'User Involvement and MIS Success: A Review of the Research' *Management Science*, Vol. 30, pp 580-603.

Ives, B.; Scott Hamilton and Gordon B. Davis (1980) 'A Framework for Research in Computer-Based Management Information Systems' *Management Science*, Vol. 26, No. 9, pp. 910-934.

Jackson, S. and Dutton, J. (1988) 'Discerning Threats and Opportunities' *Administrative Science Quarterly*, Vol. 33, pp. 370-387.

Jarvenpaa, S.L. and Ives, B. (1990) 'Information Technology and Corporate Strategy: A View From the Top' *Information Systems Research*, December, Vol. 1(4), pp. 351-376.

Jarvenpaa, S.L. and Ives, B. (1991) 'Executive Involvement and Participation in the Management of Information Technology' *MIS Quarterly*, Vol. 15(2), pp. 205-227.

Jenkin, A.M. (1985) 'Research Methodologies in MIS Research', in *Mumford et. al.*,(Eds), 1985, pp. 103-117.

Jick, T.D. (1979) 'Mixing Qualitative and Quantitative Methods: Triangulation in Action' *Administrative Science Quarterly*, Vol. 24, pp. 603-610.

Jolliffe, F.R. (1986) *'Survey Design and Analysis'* Ellis Horwood Ltd. UK.

Jones, M. and Nandhakumar, J. (1993) 'Structured Development? A Structural Analysis of the Development of an Executive information Systems' in *Avison, D., Kendall, E. and DeGross, J. I.* (Eds), 1993, North-Holland, Amsterdam.

Kaddah, M (1990) *'A Mechanism for Activating End-User Learning and Participation in Office Automation'* Unpublished Ph. D Thesis, University of Leeds, UK.

Kanter, R.M. (1983) *'The Change Master'* Simon and Schuster, New York, NY.

Kaplan, R. (1984) 'Trade Routes: The Manager's Network of Relationship' *Organizational Dynamics*, Spring, pp. 37-52.

Kaplan, B. and Duchon, D. (1988) 'Combining Qualitative and Quantitative Methods in Information Systems Research: A Case Study' *MIS Quarterly*, Vol. 12, No. 4, pp. 570-586.

Keen, P. (1981) 'Information Systems and Organizational Change' *Communications of the ACM*, Vol. 24, pp. 24-33.

Keen, P (1984) 'Planning for Successful Innovation' in Otway, H., and Peltu, M., (Eds), *The Managerial Challenge of New Office Technology*, Butterworths, London.

Keil, M. (1991) *'Managing MIS Implementation: Identifying and Removing Barriers to Use'* Unpublished Ph D Thesis, Harvard University, USA.

Kiesler, C.A. (1971) *'The Psychology of Commitment: Experiments Linking Behaviour to Belief'* Academic Press, New York, NY.

Kimble, C. and McLoughlin, K. (1995) 'Computer Based Information Systems and Managers' Work' *New Technology, Work and Employment*, Vol. 10, No. 1, pp. 56-67.

Kim, J. and Mueller, C.W. (1978) *'Factors Analysis -Statistical Methods and Practical Issues'* London: Sage Publications.

Kim, J. and Mueller, C.W. (1986) *'Introduction to Factor Analysis - What It Is and How To Do It'* London: Sage Publications.

Klein, H.K. and Hirschheim, R.A. (1983) 'Issues and Approaches to Appraising Technological Change in the Office; A Consequentialist Perspective' *Office: Technology & People*, pp. 15-40.

Klein, H.K. and Kumar, K. (Eds) (1989) *'Systems Development for Human Progress"* Proc. of IFIP WG 8.2 Working Conference on Information Systems Development in Organizations, North-Holland, Amsterdam.

Kling, R. (1987) 'Defining the Boundaries of Computing Across Complex Organizations' in *Boland, R. and Hirschheim, R.* (Eds), 1987.

Kling, R. and Iacono, S. (1984a) 'Computing as an Occasion for Social Control' *Journal of Social Issues*, Vol. 40, No. 3, pp. 133-140.

Kling, R. and Iacono, S. (1984b) 'The Control of Information Systems Developments after Implementation' *Communications of the ACM*, Vol. 27, No. 12, pp. 1218-1226.

Kling, R. and Iacono, S. (1989) 'The Institutional Character of Computerized Information Systems' *Office, Technology and People*, Vol. 5, No. 1, pp. 7-28.

Kling, R. and Scacchi, W. (1980) 'Computing as Social Action: The Social Dynamics of Computing in Complex Organisations' *Advances in Computers*, Vol. 19, pp. 249-323.

Kling, R. and Scacchi, W. (1982) 'The Social Web of Computing: Computer Technology as Social Organisation' *Advances in Computers*, Vol. 21, pp. 2-90.

Kotter, J. (1982) *'The General Manager'* New York, Free Press.

Kutti, K. (1991) 'Activity Theory and Its Applications to Information Systems Research and Development' in *Nissen et al.*, (Eds), 1991, pp. 529-549.

Kwon, T.H. and Zmud, R.W. (1987) 'Unifying the Fragmented Models of Information Systems Implementation' in *Boland, R. and Hirschheim, R.* (Eds), 1987, pp. 227-251.

Land, F., Le Quesne, P.N. and Wijegunaratne, I. (1989) 'Effective Systems: Overcoming the Obstacles' *Journal of Information Technology*, Vol. 4, No. 2, pp. 81-91.

Land, F.; Mumford, E. & Hawgood, J. (1980) 'Training the Systems Analyst of the 1980s: Four Analytical Procedures to Assist the Design Process' in Lucas, H. C.; Land, F.; Lincoln, T. J. & Supper, K. (Eds), 1980, *The Information Systems Environment*, North-Holland: Amsterdam.

Lawrence, P.R. and Lorsch, J.W. (1967) 'Differentiation and Integration in Complex Organizations' *Administrative Science Quarterly*, Vol. 12, pp. 1-47.

Lee, A.S. (1989) 'A Scientific Methodology for MIS Case-Studies' *MIS Quarterly*, Vol. 13, pp. 33-50.

Lee, A.S. (1991) 'Integrating Positivist and Interpretative Approaches to Organizational Research' *Organization Science*, Vol. 2, No. 4, pp. 342-365.

Lee, D.M.S. (1986) 'Usage Patterns and Sources of Assistance for Personal Computer Users' *MIS Quarterly,* Vol. 10 (4), pp. 313-325.

Lederer, A.L. and Mendelow, A.L. (1987) 'Information Resource Planning: Overcoming Difficulties in Identifying Top Management's Objective' *MIS Quarterly*, Vol. 11(3), pp. 389-399.

Levine, H.G. and Rossmoore, D. (1995) 'Politics and the Function of Power in a Case Study of IT Implementation' *Journal of Management Information Systems*, Winter, Vol. 11 (3), 115-133.

Lewin, K. (1952) *'Field Theory in Social Science'* Tavistock, London.

Lewis, R.C.(1984), 'Theoretical and Practical Considerations in Research Design' *The Cornell H.R.A Quarterly*, February 1984, pp. 25 - 35.

Linstone, H.A. (1981) *'Multiple Perspective for Decision Making: Bridging the Gap Between Analysis and Action'* New York: North-Holland.

Linstone, H.A and Mitroff, I.I. (1994) *'The Challenge of the 21st century: Managing Technology and Ourselves in a Shrinking World'* State University of New York Press, Albany, NY.

Lucas Jr, H.C. (1981) *'Implementation: The Key to Successful Information Systems'* Columbia University Press, New York.

Lucas Jr, H.C. (1990) *'Information Systems Concepts for Management'* (4th Edition), McGraw-Hill, New York.

Lucas Jr, H.C., Ginzberg, M.J. and Schultz, R.L. (1990) *'Information Systems Implementation: Testing a Structural Model'* Ablex Publishing, Norwood.

Lyytinen, K.J. (1986) *'Information Systems Development as Social Action: Framework and Critical Implications'* Unpublished Ph.D. Thesis, Department of Computer Science, University of Jyvaskyla, Finland.

Lyytinen, K.J. and Hirschheim, R. (1987) 'Information Systems Failures - A Survey and Classification of the Empirical Literature' *Oxford Surveys in Information Technology*, Vol. 4, pp. 257-309.

Lyytinen, K.J. and Hirschheim, R. (1988) 'Information Systems as Rational Discourse: An Application of Habermas's Theory of Communicative Action' *Scandinavian Journal of Management*, Vol. 4, No 1/2, pp. 19-30.

Lyytinen, K.J., Klein, H. and Hirschheim, R. (1986) 'The Effectiveness of Office Information Systems: A Social Action Perspective' *RDP 86/14: Oxford Institute of Information Management*, Templeton College.

MacDonald, S. (1985) 'Technology Beyond Machines' in *Rhodes, E and Wield, D.* (Eds), Basil Blackwell, pp. 41-49.

Maidique, M.A. (1980) 'Entrepreneurs, Champions and Technological Innovation' *Sloan Management Review*, Winter, Vol. 21 (2), pp. 59-76.

'Malaysia Federal Constitution' (1986) MDC Sdn. Bhd. Kuala Lumpur.

Manly, B.F.J. (1986) *'Multivariate Statistical Methods - A Primer'* London: Chapman and Hall.

Markus, M.L. (1984) *'Systems in Organizations: Bugs and Features'* Pitman, Boston, MA.

Markus, M.L. and Pfeffer, J. (1983) 'Power and the Design and Implementation of Accounting and Control Systems' *Accounting, Organizations and Society*, Vol. 8, No. 2/3, pp. 205-218.

Markus, M.L., and Robey, D. (1988) 'Information Technology and Organizational Change: Causal Structure in Theory and Research' *Management Science*, Vol. 34, No. 5, pp. 583-598.

Matherly, T. and Matherly, D. (1985) Employee Participation Eases the Transaction to Office Automation' *Journal of Systems Management*, (February).

McCaskey, B. (1982) *'The Executive Challenge: Managing Change and Ambiguity'* Ballinger Publishing Company.

McKersie, R.B. and Walton, R.E. (1991) 'Organizational Change' in *Morton, S.* (Ed), 1991, pp. 244-277.

McLoughlin, I. and Clark, J. (1988) *'Technological Change at Work'* Open University Press.

Metçalfe, S. and Boden, M. (1990) 'Strategy, Paradigm and Evolutionary Change' Paper presented to a *Workshop on Processes of Knowledge Accumulation and the Formulation of Technology Strategy*, Rosnaes, Denmark, 20-23 May.

Mintzberg, H. (1973) *'The Nature of Managerial Work'* New York. Harper & Row.

Mintzberg, H. (1975) 'The Manager's Job: Folklore and Fact' *Harvard Business Review*, July-August, pp. 49-61.

Mintzberg, H. (1994) *'The Rise and Fall of Strategic Planning'* Free Press and Prentice Hall International.

Mitroff, I.I. and Linstone, H.A. (1993) *'The Unbounded Mind: Breaking the Chains of Traditional Business Thinking'* New York: Oxford University Press.

Mohamed, R.M. (1990) *'Designing a Methodology for an Office Communication and Information System for Executives in the Malaysian Public Sector: The Case of the Prime Minister's Office'* Unpublished Thesis, University of Aston, Birmingham, UK.

Mohr, L.B. (1982) *'Explaining Organizational Behaviour'* Jossey-Bass, San Francisco, CA.

Morgan, G. (1983) *'Beyond Method: Strategies for Social Research'* Sage, New York.

Morgan, G. and Smircich, L. (1980) 'The Case of Qualitative Research' *Academy of Management Review*, Vol. 5, No. 4, pp. 491-500.

Morgan, M.J. (1986) *'Images of Organization'* Sage Publications: Beverley Hills.

Morgan, M.J. (1992) 'Systems Implementation Strategy: Behavioural and Organizational Aspects' *Industrial Management and Data Systems*, Vol. 92 (8), pp. 20-24.

Morton, M.S. Scott (Ed) (1991) *'The Corporation of the 1990s'* New York: Oxford University Press.

Mumford, E (1987) 'Sociotechnical Systems Design: Evolving Theory and Practice' in Bjerknes, G; Ehn, P. and Kyng, M (Eds), 1987, *Computer and Democracy: A Scandinavian Challenge*, Avebury: Aldershot.

Mumford, E. (1995) *'Effective Systems Design and Requirements Analysis: The ETHICS Approach'* MacMillan Press Ltd.

Mumford, E., Hirschheim, R., Fitzgerald, G. and Wood-Harper, T. (Eds) (1985) *'Research Methods in Information Systems'* North-Holland, New York.

Myers, M.D. (1994) 'Dialectical Hermeneutics: A Theoretical Framework for the Implementation of Information Systems' *Information Systems Journal*, Vol. 5, pp. 51-70.

Narayanan, V.K. and Nath, R. (1993) *'Organization Theory: A Strategic Approach'* Irwin, Boston.

Newman, M. & Robey, D. (1992) 'A Social Process Model of User-Analyst Relationships' *MIS Quarterly*, Vol. 16, pp. 249-266.

Nissen, H.; Klein, H.; and Hirschheim, R. (Eds) (1991) *'Information Systems Research: Contemporary Approaches and Emergent Traditions'* North-Holland, Amsterdam.

Northrop, A., W.H. Dutton, and K.L. Kraemer (1982) 'The Management of Computer Applications in Local Government' *Public Administration Review,* Vol. 42, No.5, pp. 234-243.

Norusis, M.J. (1988) *'The SPSS Guide to Data Analysis for SPSS/PC+'* Chicago, SPSS Inc.

Nunnally, J. (1967) *'Psychometric Theory'* New York: McGraw-Hill.

Nurminen, M (1988) *'People or Computers. Three Ways of Looking at Information Systems'* Studentlitteratur, Lund.

Orlikowski, W.J. (1992) 'The Duality of Technology: Rethinking the Concept of Technology in Organisations' *Organisation Science*, Vol. 3, No. 3, pp. 398-427.

Orlikowski, W.J. and Baroudi, J.J. (1991) 'Studying Information Technology in Organisations: Research Approaches and Assumptions' *Information Systems Research*, Vol. 2, pp. 1-28.

Orlikowski, W.J. and Robey, D. (1991) 'Information Technology and the Structuring of Organizations' *Information Systems Research*, Vol. 2, No. 2, pp. 143-169.

Pervan, G.P. and Klass, D.J. (1992) 'The Use and Misuse of Statistical Methods in Information Systems Research' in *Galliers, R.D.* (Ed), 1992, pp. 208-229.

Peterson, C. and Peterson, T. (1986) 'The Dark Side of Office Automation: How People Resist the Introduction of Office Automation Technology' *Texas A and M University Symposium Human Factors in Management Information System*, College Station, TX, USA.

Pettigrew, A.M. (1985) *'The Awakening Giant: Continuity and Change in ICI'* Basil Blackwell, Oxford.

Pinsonneault, A and Kraemer, K.L. (1993) 'Survey Research Methodology in Management Information Systems: An Assessment' *Journal of Management Information Systems*, Vol. 10, No. 2, pp. 75-105.

Quinn, R.E. (1988) *'Beyond Rational Management: Mastering the Paradoxes and Competing Demands of High Performance'* San Francisco: Jossey-Bass.

Quinn, R.E. and Rohrbaugh, J. (1983) 'A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organizational Analysis' *Management Science*, Vol. 29, No. 3, pp. 363-377.

Rajan, A. (1992) *'1990s Where Will the New Job Be?'* Centre for Research in Employment and Technology in Europe, Turnbridge Wells, Kent.

Reason, P. and Rowan, J. (Eds) (1981) *'Human Inquiry: a Sourcebook of New Paradigm Research'* John Wiley and Sons, Chichester.

Reid, S. (1987) *'Working with Statistics: An introduction to Quantitative Methods for Social Scientist'* Polity Press in association with Basil Blackwell, UK.

Rhodes, E and Wield, D. (Eds) (1985) *'Implementing New Technologies, Choice, Decision and Change in Manufacturing'* Oxford, Basil Blackwell.

Rist, R.(1977) 'On the Relations Among Educational Research Paradigms: From Disdain to Detente' *Anthropology and Education*, Vol. 8, pp. 42-49.

Rivard, S., and Huff, S.L. (1988) 'Factors of Success for End User Computing' . *Communication of the ACM*, Vol. 31(5), pp. 552-561.

Robey, D., Gupta, K. and Rodriguez-Diaz, A. (1990) 'Implementing Information Systems in Developing Countries: Organizational and Cultural Considerations' in *Bhatnagar S. and N., Bjorn Andersen* (Eds), 1990, pp. 41-50.

Rockart, J.F. (1988) 'The Line Takes the Leadership- IS Management in a Wired Society' *Sloan Management Review*, Vol. 29(4), pp. 57-64.

Rockart, J.F. (1995) 'The End of Delegation? Information Technology and the CEO' *Harvard Business Review*, Sep./ Oct., pp. 161-172.

Rockart, J.F. and De Long, D.W. (1988) *'Executive Support Systems: The Emergence of Top Management Computer Use'*, Dow Jones, Irwin.

Rogers, E.M. (1983) *'The Diffusion of Innovations'* (3rd Edition), Free Press, New York, NY.

Runge, D.A. (1988) *'Winning With Telecommunications: An Approach for Corporate Strategy'* International Centre for Information Technologies, Washington DC.

Rushinek, A. and Rushinek, S.F. (1986) 'What Makes Users Happy' *Communications of the ACM*, Vol. 29(7), pp. 594-598.

Schein, E.H. (1961) 'Management Development as a Process of Influence' *Industrial Management Review*, Vol. 2, pp. 59-77.

Schon, D.A. (1963) 'Champions for Radical New Inventions' *Harvard Business Review*, March-April, Vol. 41 (2), pp. 77-86.

Singh, S.K. (1993) 'Using Information Technology Effectively: Organizational Preparedness Models' *Information and Management*, Vol. 24 (3), pp. 136-146.

'Sixth Malaysia Plan 1990-1995' (1990) National Printing Department, Kuala Lumpur.

Smithson, S.C. and Land, F.F. (1986) 'Information Systems Education for Development' *Information Technology for Development*, Vol. 1, No. 2, pp. 59-74.

Srinivasan, A. & Davis, J.G. (1987) 'A Reassessment of Implementation Process Models' *Interfaces*, Vol. 17, No. 3, pp. 64-71.

Stuart, A. and J. Keith Ord (1994) *'Kendall's Advanced Theory of Statistics - Vol. 1: Distribution Theory'* (6th Edition), The University Press (Belfast) Ltd.

Symons, V.J. (1990) *'Evaluation of Information Systems: Multiple Perspectives'* Unpublished Ph D Thesis, Cambridge University, UK.

Tait, P. and Vessey, I. (1988) 'The Effect of User Involvement on System Success: A Contingency Approach' *MIS Quarterly*, Vol. 12, pp. 91-108.

Tricker, R. I. (1992) 'The Management of Organizational Knowledge' in *Galliers, R.D.* (Ed), 1992, pp. 14-27.

Ulrich, W. (1988) 'Systems Thinking, Systems Practice, and Practical Philosophy; A Program of Research', *System Practice*, Vol. 1, no. 2, pp. 137-163.

Van de Ven, A.H. and Huber, G.P. (1990) 'Longitudinal Field Research Methods for Studying Processes of Organizational Change' *Organization Science*, Vol. 1, No. 3, pp. 213-219.

Venugopal, P. (1990) *'Improvement and Development in the Public Service 1990'* MAMPU, Prime Minister's Department, Malaysia.

Vidgen, R., Rose, J., Wood, JRG and Wood-Harper, A.T. (1994) 'Business Process Reengineering: The Need for a Methodology to Re-vision the Organisation' in *Glasson et al.*, (Eds), 1994, pp. 603-612.

Visala, S. (1991) 'Broadening the Empirical Framework of Information Systems Research' in *Nissen et al.*, 1991, pp. 347-364.

Vitale, M and Ives, B. (1988) *'Finding and Fostering Innovative Applications of Information Technology: The US Perspective. Part II: The Lessons'* Working Papers, International Center for Information Technologies, Washington DC.

Walsham, G. (1989) *'Organization Theory and Information Systems: Alternative Metaphor'* Unpublished: Cambridge University Management Studies Group.

Walsham, G. (1992) 'Management Science and Organizational Change: A Framework for Analysis' *Omega*, Vol. 20 (1), pp. 1-9.

Walsham, G. (1993) *'Interpreting Information Systems in Organizations'* John Wiley and Sons, Chichester.

Walsham, G. (1995) 'Interpretive Case Studies in IS Research: Nature and Method', *European Journal of Information Systems*, Vol. 4, pp. 74-81.

Walsham, G. and Han, C.K. (1990) 'Structuration Theory and Information Systems Research' in DeGross, J.I., Alavi, M., and Oppelland, H., (Eds), 1990, *Proceedings of the Eleven International Conference in Information Systems*, Copenhagen, 16-19 December, pp. 53-59.

Walsham, G. and Han, C.K. (1991) 'Structuration Theory and Information Systems Research' *Journal of Applied Systems Analysis*, Vol. 18, pp. 77-85.

Wastell, D.G. (1993) 'The Social Dynamics of Systems Development: Conflict, Change and Organisational Politics' in S. Esterbrook (Ed), 1993, *CSCW: Cooperation or Conflict?* Springer-Verlag, London, pp. 69-91.

Watson, R.T. (1990) 'Influences on the IS Manager's Perceptions of Key Issues: Information Scanning and the Relationship With the CEO' *MIS Quarterly*, June, Vol. 14(2), pp. 217-231.

Webb, E.J., Campbell, D.T., Schwartz, D., and Sechrest, L. (1966) *'Unobtrusive Measures: Non-reactive Research in the Social Sciences'* Chicago, Rand McNally.

White, D. (1987) 'Research Methods in Information Systems; Mumford, E. et al,.: Book Review' *International Journal of Information Management*, Vol. 7, No. 1, pp. 58-59.

Wilkinson, B. (1983) *'Shop-Floor Politics of New Technology'* Heinemann Educational Books.

Wilcocks, L. and Harrow, J. (1992) *'Rediscovering Public Services Management'* Maidenhead McGraw Hill.

Wilcocks, L.P. and Mark, A.L. (1989) 'IT Systems Implementations: Research Findings from the Public Sector' *Journal of Information Technology*, Vol. 4, No. 2, pp. 92-103.

Wilson, B (1984) *'Systems: Concepts, Methodologies, and Applications'* John Wiley: Chichester.

Winograd, T. & Flores, F. (1987) *'Understanding Computers and Cognition, A New Foundation for Design'* Addison-Wesley, New York.

Wood, JRG, Vidgen, R., Wood-Harper, A.T. and Rose, J. (1994) 'Business Process Redesign: Radical Change or Reactionary Thinkering?' in *Exploring Business Process Re-engineering: Current Perspectives and Research Directions*, Peppard, J. (Ed), Kogan, p. 1935.

Woodward, N. (1987) *'Managing Cultural Change in Privatisation'* MRP 87/19: Templeton College Oxford.

Wood-Harper, A.T. (1989) *'Comparison of Information Systems Definition Methodologies: An Action Research Multiview Perspective'* Unpublished PhD Thesis, University of East Anglia, Norwich, UK.

Wood-Harper, A.T. and Avison, D.E. (1992) 'Reflections from the Experience of using multiview through the lens of soft systems methodology' *Systemist*, Vol. 14, No. 3, pp. 136-145.

Yin, R.K. (1989) *'Case Study Research: Design and Methods'* (rev. ed.), Newbury Park, London, Sage.

Yin, R.K. (1993) *'Applications of Case Study Research'* Applied Social Methods Series, 34, Sage Publication, Newbury Park.

Zakaria A. Aziz (1982) *'Pengenalan Kepada Jentera Pentadbiran Kerajaan Di Malaysia'* Dewan Bahasa dan Pustaka, Kuala Lumpur.

Zuboff, S. (1988) *'In the Age of Smart Machine'* Heinemann Professional Publishing.

Appendices

Appendix 4.1

An Overview of the Statistical Procedures Used in the Study

1. An Overview

Questionnaire surveys involve asking questions and documenting the responses, which may perhaps be straightforward ("yes", "no", "don't know") or possibly may evoke fuller descriptive answers, for example, in situations involving "open questions". In the first case, where straightforward responses are documented, these responses can be easily quantified by noting the frequency of the responses, for example; 70% agree, 20% disagree, 10% don't know. Where descriptive answers are encountered or sought, these responses must be classified according to some scheme (e.g. "good", "bad", "indifferent") that is relevant to the objectives of the investigation. Even so, it is only possible to provide some meaningful interpretation of responses, in an analytical way, according to the frequency of occurrence of these responses.

The classifications "good", "bad", and "indifferent" can be regarded as descriptive factors (variables) that relate in some way to the question, and indicate to what degree the question has validity. To the question "Are you motivated in your work?" - all the respondents may say "No," indicating that the question has validity and deserves further investigation. A further question may be asked: "Are you satisfied with your pay-scale?" If all respondents reply "No," this indicates that this variable (the question of pay) is correlated to an other variable (motivation), by comparing the frequency tables of the two variables (crosstabulation). In practice, when different questions are asked, other variables may be found to be influencing each other. Also, the apparent correlation of variables may be due to chance events, which may have arisen out of, for example, some untypical, temporary situation; or from a narrow or unrepresentative choice of respondents.

It should be noted that a random variable possessing a frequency distribution comes within the definition of a "variate" in statistical analysis. A frequency table can be produced for pay scales within a sample of respondents. This would give an

univariate distribution of salaries. Similarly, for the same set of respondents, a frequency table of length of service could be produced, providing another univariate distribution. It is reasonable to assume there would be a correlation between these two variables (pay and length of service), and it would be valid to tabulated these variables within the same frequency table.

Examining variables is an important part of the process and careful examination of each variable towards the objective, and towards other variables, can reduce the chance of errors during the analysis. Through examining frequency tabulations, variables can be "cleaned up". This is independent of statistical manipulation and, regardless of what statistical methods are to be employed and what the frequency tabulations are, it is therefore usually the first step in the statistical analysis being considered when summarising data (Bryman and Cramer, 1990; Norusis, 1988). Norusis (1988) suggested that unless data is "cleaned up", all subsequent analyses will be incorrect. Most importantly, through the univariate frequency analysis procedure, one would be able to determine whether a variable fall within the range of a normal distribution, so that meaningful interpretations can be made. It is the purpose of interpretation to search for the broader meaning of statistical results by linking them to other available knowledge (Sellitz *et al.* 1967, p 386).

The results of survey questionnaires can be expressed quantitatively within stated levels of dispersion. If the "dispersion" between two variables is large, in crosstabulation, the result cannot be considered relevant, but indicates that other variables must be sought that provide a better correlation. Even so, such conclusions can only be applied to a particular sample of respondents. The result cannot be generalised to larger groups without further calculations to determine the relevance of doing this. This procedure is not considered to be descriptive, in nature, because inferences are being made. The procedure involves inferential statistical analysis. Methods have been developed to do this, and it is very useful to use inferential

statistics to examine the significance levels of certain statistical outputs such as Chi-square and Kendall's tau (D. A. Vaus, 1993).

By considering these measurable characteristics together, within the same analysis, a joint distribution of two variables can be examined. Within this bivariate distribution, analyses can be made to test for the correlation that would be sensibly expected. The analysis would also identify the confidence levels within which the correlation operated. Even so, the starting-point is to construct univariate frequency distributions for variables that are judged to have some relevance to the objective of the research. According to Reid (1987, p. 50), univariate frequency distributions organise the information into a more readable and comprehensive form. This enables the researcher to identify any significant patterns in the distribution of cases and provides "leads" for further investigations.

The statistical analyses for this research were carried out using the SPSS for WINDOWS program. Statistical analysis for this study has involved mainly descriptive and inferential statistics. For the descriptive statistics, the univariate analysis of FREQUENCY (e.g. relative frequency, cumulative frequencies), MEAN, and FACTOR analysis were utilised in the first stage. CROSSTABULATION were then used. to display associations and relationships between variables. The inferential statistics will mainly involve the Chi-square and Kendall's tau to examine the "significant levels" and "measure of associations" of the variables.

It is the belief of the present researcher that the aims and objectives of this study can be achieved by using univariate analysis. Since need arose to explore the data for relationships between variables, bivariate analyses using crosstabulation were also used to satisfy requirements.

Appendix 4.2

Letters

UNIVERSITY OF SALFORD

Salford M5 4WT, England/Telephone:061-745 5000/Telex: 668680 (Sulib)/Fax:061-745 5999

Professor A T Wood-Harper, MA, PhD, MBCS, Department of Mathematics and Computer Science

20 January 1994

Director-General
Public Service Department Malaysia
Training and Career Division
Aras 2, Blok B, Kompleks JPA, Jalan Tun Ismail
50510 Kuala Lumpur
MALAYSIA
(Att. Mr Saad bin Ismail)
(Ref: JPA/L5371242)

Through:

Director
Malaysian Students Department
44 Bryanston Square
London W1H 8AJ
(Att. Mr Mohd Yamin bin Mohd Yusof)
Ref: JPM/LON/JDB921738)

Dear Sir

Fieldwork survey in Malaysia (May-August 1994) Mokhtar bin Mohd Yusof

Mr Mokhtar Mohd-Yusof is doing research at University of Salford. His research is concerned with *"The influence of senior executive's behaviour on computer-based information systems development process: The case of Malaysian Government Agencies"*. He is being supervised by myself.

His research seeks to investigate information systems (IS) management and functions in government organisation and its relationship to the senior executives' leadership roles and IS development process. To provide an empirical basis for the thesis research, he has to conduct a personally administered questionnaire survey, observations and interviews in Malaysia. The interviews will involve Senior Civil Servants and Information System Practitioners in government organisations. In addition, he proposes to collect relevant secondary data for the thesis.

His field work survey is planned in late May for three months. I strongly support the field work survey programme as partial fulfilment of his Ph.D programme.

Yours sincerely

Professor A.T. Wood-Harper
(Supervisor)

UNIVERSITY OF SALFORD

Salford M5 4WT, England/Telephone:061-745 5000/Telex: 668680 (Sulib)/Fax:061-745 5999

Department of Mathematics and Computer Science

Direct Fax: 061-745 5559
Email:M.MOHDYUSOF@MCS-STAFF.SALFORD.AC.UK.

28th March 1994.

To All IS Manager.

Dear colleague,

I am currently doing a research at University of Salford, and my research is concern with *"The influence of senior executives' behaviour on computer-based information systems development process: The case of Malaysian Government Agencies."* I am being supervised by Professor A.T. Wood-Harper of Salford University.

The attached questionnaire is part of the research. The main objective is to provide information about the profile of information systems (IS) management and functions in government organisation and its relationship to the senior executives' leadership roles and IS development process.

The outcome of this research will help IS practitioners in formulating senior executives' involvement strategy and its implementation framework in IS development process.

I appreciate taking your time in filling out the attached questionnaire, however it should be stressed that it is not intended for you to spend too much time on any specific item. Should any of the questions not be applicable to your environment, or would touch on what you would consider sensitive or confidential information, then skips to the next question.

Again, your valuable assistance in completing this questionnaire is much appreciated. Thank you.

Yours sincerely.

Mokhtar Mohd-Yusof.

Local Representative: Dr. Raja Malek Mohamed, PLKN, National Institute of Public Administration, Malaysia. (INTAN) Jln Elmu, 59700 Kuala Lumpur. Tel: 03-7578261/ 7579155

Ketua Pengarah Perkhidmatan Awam

Jabatan Perkhidmatan Awam
Tingkat 12, Wisma Bernama
Jalan Tun Razak
50510 Kuala Lumpur
Telefon: 2938578
Kawat: FESTOFF MA 31581
Fax: 2925808

Rujukan tuan:

Rujukan kami: JPA(T)334/2 Klt 9 (56)

Tarikh: 29 Mac, 1994

Y.Bhg. Tan Sri/Dato'Tuan/Puan,

Kajian Mengenai Tanggapan Dan Tingkahlaku Eksekutif-Eksekutif Kanan Sektor Awam Dan Kaitannya Dengan Amalan Pembangunan Sistem Maklumat Berkomputer Di Sektor Awam, Malaysia.

Sukacita saya maklumkan satu kajian sedang dijalankan oleh Encik Mokhtar bin Mohd. Yusof mengenai tanggapan dan tingkahlaku eksekutif-eksekutif kanan sektor awam terhadap sistem maklumat dan kaitannya dengan amalan pembangunan sistem maklumat berkomputer dalam sektor awam, Malaysia.

2. Buat makluman Y.Bhg. Tan Sri/Dato'/Tuan/Puan, Encik Mokhtar bin Mohd Yusof adalah seorang pegawai Perkhidmatan Juruanalisa Sistem dalam sektor awam di Malaysia. Beliau sedang mengikuti pengajian di peringkat ijazah kedoktoran (Ph.D) di Department Of Mathematics and Computer Science, University Salford, United Kingdom. Program pengajian dan penyelidikan beliau ini adalah ditaja oleh Jabatan Perkhidmatan Awam, Malaysia.

3. Saya percaya hasil kajian ini nanti akan memberi faedah yang besar kepada perkhidmatan awam khususnya dalam merumuskan penglibatan eksekutif-eksekutif kanan dan para pengamal pembangunan sistem seperti Pengurus-pengurus Komputer/Juruanalisa Sistem dalam proses pembangunan sistem maklumat berkomputer. Dalam hubungan ini, kerjasama penuh Y.Bhg. Tan Sri/Dato'/Tuan/Puan adalah diminta bagi menjayakan kajian ini terutamanya dalam urusan temubual dan penyempurnaan borang soalselidik yang terlibat kelak.

4. Di atas kerjasama Y.Bhg. Tan Sri/Dato'/Tuan/Puan, saya ucapkan terima kasih.

Sekian.

BERKHIDMAT UNTUK NEGARA

Saya yang ikhlas,

(TAN SRI DATO' MAHMUD BIN TAIB)
Ketua Pengarah Perkhidmatn Awam,
MALAYSIA.

THE UNIVERSITY OF MICHIGAN
SCHOOL OF BUSINESS ADMINISTRATION

701 TAPPAN STREET
ANN ARBOR, MICHIGAN 48109-1234

April 4, 1994

Dr. Mokhtar Mohd-Yusof
University of Salford
Department of Mathematics and Computer Science
Salford M5 4WT
ENGLAND

Dear Dr. Mohd-Yusof:

I have received your letter of 16 March 1994 requesting permission to use the 16 questions listed in the appendix of my paper, coauthored with Professor Quinn, entitled "Roles Executives Play: Behavioral Complexity, and Firm Performance," which appeared in Human Relations, Vol. 46, No. 5, 1993.

Please be advised that permission to use these items is granted.

Sincerely,

Stuart L. Hart
Assistant Professor
Corporate Strategy

SLH:jw

HARVARD UNIVERSITY

GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

GEORGE F. BAKER FOUNDATION

Sirkka Jarvenpaa
Marvin Bower Fellow

Soldiers Field
Boston, Massachusetts 02163
Phone: 617-495-6326
FAX: 617-496-2910

Mokhtar Mohd-Yusof
Department of Mathematics and Computer Science
University of Salford
Salford M5 4WT
England

Dear Mr. Mohd-Yusof:

Thank you very much for your letter dated Jan. 28th. I am delighted that you would like to use the survey questions from our article, "Executive Involvement and Participation,..." . You have our permission to use the survey questions.

Best of luck with your research. I would be very interested in getting a copy of your final research report.

Cordially,

Sirkka Jarvenpaa

Appendix 4.3

Survey Questionnaire

UNIVERSITY OF SALFORD

Department of Mathematics & Computer Science

GOVERNMENT ORGANISATIONS' INFORMATION SYSTEMS DEVELOPMENT (ISD) PROCESS SURVEY

The Questionnaire is divided into the following sections:

Section A:	(1) Profile of IS Management and Functions in Government Organisations, (2) Information Systems Development Process, (3) Measuring IS Manager's Perception Towards Their Organisation, (4) Measuring Head of Organisation's Perception Towards IS/ IT Function,
Section B:	Measuring Executive Leadership Roles in Government Organisations.

WHO SHOULD COMPLETE THIS QUESTIONNAIRE:

This questionnaire is intended for the ***most senior information systems (IS) executive*** within your organisation. If you are not that individual, please forward the entire packet to him or her.

CONFIDENTIALITY:

This survey is undertaken in the strictest confidence. The result of the survey will only be used in aggregate form. No individual data will be used in any report except for brief and unattributed quotations from the 'comment'.

No attempt will be made to identify individuals.

If you have any doubts or questions concerning this questionnaire, please do not hesitate to contact:

Researcher: Mokhtar Mohd-Yusof, Dept. of Maths & Computer Science, University of Salford, Salford M5 4WT England. Fax: 061-745-5559. email M.MohdYusof@mcs-staff.salford.ac.uk, or

Local Representative: Dr. Raja Malek Mohamed, PLKN, National Institute of Public Administration, Malaysia. (INTAN) Jln Elmu, 59700 Kuala Lumpur. Tel: 03-7578261/ 7579155

(March 1994)

SECTION A1: Profile of IS Management and Functions

Please circle the appropriate answer.

1. Name of respondent:_____

2. Name and address of organisation:_____

_____

_____

3. Please provide the title and rank (if applicable) of the person you report to: (This person will be referred later in this questionnaire as **Your Superior**.)

Position/ Title (e.g.: Secretary General/ Deputy, Director General/ Deputy, etc.)	Rank/ Grade (e.g.: JUS: A, B, C, M1, etc.)

4. What is your position and rank (if applicable) in the organisation?

Position/ Title (e.g.: Director, Manager, etc.)	Rank/ Grade (e.g.: F1, M1, etc.)

5. How many levels are you from the head of the organisation?

1 2 3 4 5 6

6. How many years have you held *your current position*?

1 2 3 4 5 more than 5

7. To the best of your knowledge, how many years has your head of organisation been in his or her current position?

1 2 3 4 5 6 7 8 9 10 more than 10

8. To the best of your knowledge, how many years has **your superior** (in question 3) been in his or her current position?

1 2 3 4 5 6 7 8 9 10 more than 10

9. How many people are employed by your organisation, from the head of organisation down to the office worker and maintenance personnel?

1	2	3	4
Less than 100	100 - 500	501 - 1000	More than 1000

10. What year was data processing first introduced in this organisation?_____

11. What is the percentages of the data processing/IS function budget compared to the total annual budget of your host organisation ?

	Data Processing(DP)/ IS Function Budget(%)
Year 1992	
Year 1993	
Year 1994	

12. How many personnel are employed within the data processing function?

DP Personnel:		Non-DP Personnel:	
System Analysts		_____	
Programmers		_____	
Operations personnel		_____	
_____		_____	
Total		Total	

13. What is the total number of application system installed in your organisation? (A system is defined as software developed, installed, and maintained as an integrated unit.)

	Under Development	Installed	Maintained
Year 1992			
Year 1993			
Year 1994			

Please respond to question 14 using the following scale:

1	2	3	4
Less than 100	100 - 500	501 - 1000	More than 1000

14. What is the size of the user population served by the current installed application system? (The user population is defined here as the total number of personnel in the user department served.)

Application System Name:	

SECTION A2: Information Systems Development Process

The following set of questions attempts to obtain information about ISD process and IS projects profile in your organisation.

IS Development Phase

15. Were any private software houses involved in the development of IS project?

Yes	
No	

If yes, please identify at which stages of the project and the percentage of progress?

STAGE (Please tick)		**PROGRESS** (%)
IS Planning/ Strategy		
Feasibility Study		
Analysis		
Design		
Implementation		
Maintenance		

Optional comment_____

16. Was any specific **Project Management** methodology or approach followed?

Yes	
No	

If yes, please identify, or specify some characteristic features.

_____

_____

_____

_____

17. Was any specific systems analysis and design methodology applied?

Yes	
No	

If yes, please indicate methodology. (e.g.,IEM, SSADM, etc.)

_____

If not, what techniques and tools are being used? (e.g., DFD, etc.)

_____

18. Did users and senior management participate in the information systems development (ISD) process?

Yes	
No	

Please answer Question 18 (a)

18 (a) Who were they and at what stage;(please tick)

POSITION/ TITLE	IS Planning/ Strategy	Feasibility Study	Analysis	Design	Implementation	Maintenance
Top Executives:						
Middle Executives:						
Operational Staff:						

IS Implementation Phase

Please respond to the questions using the following scale:

1	2	3	4	5
Almost never	**Some of the time**	**About half of the time**	**Most of the time**	**Almost always.**

19. Are projects implemented in order of payoff potential?	
20. Are project implemented on a crash basis?	
21. Are systems development resources constantly shifted to respond to crisis situations facing the organisation?	
22. Are you frustrated with the way in which project priorities are set, reviewed, and reset?	
23. Are projects delayed due to design or implementation problem?	
24. Are completed projects successful in meeting their design objective?	
25. Is it necessary to redesign and/or reprogram projects within two years of the time they become operational?	
26. After projects are implemented, is it apparent that an alternative design could have been used?	
27. After projects are implemented, is a major reprogramming effort necessary to improve processing efficiency?	
28. Do newly developed systems work the way the user expected them to?	
29. When system changes are necessary, can the changes be easily and quickly implemented?	
30. When your organisation changes how it operates, are the information systems flexible and easily changed to reflect these changes in operations?	
31. Do you think that projects are implemented in a rational sequence?	
32. Do you think that high payoff projects are implemented before projects with less benefit to the organization?	
33. Does your organisation implement the most important projects first?	
34. Are new systems designed and implemented in a manner which enhances the credibility of the Data Processing (DP) function?	

IS Maintenance Phase

35. What percentages of your systems analysis and programming man-hours are used for:

    Developing new systems

    Enhancing capabilities of existing systems

    Maintenance: insuring the continued operation at existing capability levels?

100%

36. The staffing requirements for new systems development projects may be met by increasing your total staff or reassigning existing employees from maintenance to development activities. What percentages of man-hour requirements for new projects are met by:

    Increasing your total staff?

    Reassigning existing staff?

100%

37. Considering new systems that have been operational for one or two years, to what extent were you successful in reducing the systems analysis and programming man-hours devoted to these projects after the development phase? [ ] %

38. How much has your systems and programming staff increased over the last two years? [ ] %

Please respond to this question using the following scale:

1	2	3	4	5
Almost never	**Some of the time**	**About half of the time**	**Most of the time**	**Almost always.**

39. Does the actual cost of maintaining existing systems exceed expected (or budgeted) costs? [ ]

SECTION A.3: Measuring IS Manager's Perception Towards Their Organisation

Please describe briefly the working environment in your existing organisation based on your experience. If you feel that any question is irrelevant, ambiguous or requires a more detailed answers then please ignore it, or add comments or suggestions.

40. Are the goals of the Data Processing function clear and fully understood by the top management?

Yes	
No	

Please answer Question 40 (a)

Please answer Question 40 (b)

40 (a) If yes, please state briefly your DP goals:

_____ _____

_____ _____

40 (b) If not, why and what are the reasons for the goals not being clear and fully understood by the top management?

_____ _____

_____ _____

41. Is the organisation structured appropriately to get *the job done*?

Yes	
No	

Optional Comment

_____

Please respond to this question using the following scale:

1	2	3	4	5
Not helpful		**Partly helpful**		**Truly helpful**

42. How are the 'helping mechanisms' of the organisation functioning?

Planning	
Budget	
Auditing	
Control functions by central agencies	
Others (please specify)	

_____

43. Do you have problems communicating with other divisions or groups in the organisation, especially during systems analysis and design activities?

Yes	
No	

If yes, please describes the problems briefly:

_____

_____

_____

44. How are conflicts in systems analysis and design dealt with?

_____

Please respond to questions 45, 46 & 47 using the following scale:

1	2	3	4	5
Almost never	**Some of the time**	**About half of the time**	**Most of the time**	**Almost always.**

45. How would you use each of the words/ phrases to describe the work you do?

Fascinating		Routine	
Satisfying		Boring	
Good		Creative	
Respected		Pleasant	
Useful		Tiresome	
Healthful		Challenging	
Frustrating		Simple	
Endless		Give sense of accomplishment	

46. How would you use each of the words/ phrases to describe the supervision you receive?

Asks my advice		Hard to please	
Impolite		Praises good work	
Tactful		Influential	
Up-to-date		Doesn't supervise enough	
Tells me where I stand		Annoying	
Stubborn		Knows job well	
Bad		Intelligent	
Around when needed		Lazy	

47. How do you feel about these descriptions of your job?

I'll stay overtime to finish even if I'm not paid	
The major satisfaction in my life comes from my job	
I usually show up early for work	
It's a dead-end-job and opportunity somewhat limited	
I would probably keep on working even if I didn't have to	

SECTION A.4: Measuring Your Superior's Perception Towards IS/IT Functions.

Please circle the appropriate answer.

48. Which of the following statements best describe the importance that ***your superior*** perceived IT to be for your organisation?

1	2	3	4	5	6
Has little concern for the potential utility of IT	Considers IT to be the concern of technologist, not managers, but is supportive of IT	Considers IT to be one of many ways to cut costs in the organisation.	Considers IT to be vital for smooth functioning of operations.	Considers IT as one of the vital parts of the competitive strategy	Considers IT as the single most critical factor for the organisation.

Optional Comment_____

49. How often does **your superior** get personally involved in matters related to the use of IT within the organisation?

1	2	3	4	5
Less than once a year	Few times a year	Monthly	Weekly	Daily

Optional Comment_____

50. How frequent are informal contacts between **your superior** and the organisation's IS personnel?

1	2	3	4	5
Less than once a year	Few times a year	Monthly	Weekly	Daily

Optional Comment_____

51. How knowledgeable is **your superior** about IS opportunities and possibilities for your organisation?

1	2	3	4	5
Weakly informed	Somewhat informed	Well informed	Very informed	Extremely knowledgeable

Optional Comment_____

52. How knowledgeable is **your superior** about IT innovations that have been developed by other public or private organisations?

1	2	3	4	5
Weakly informed	Somewhat informed	Well informed	Very informed	Extremely knowledgeable

Optional Comment_____

53. How would you describe your organisation's use of information technology?

1	2	3	4	5
Slow	Somewhat behind	Middle of the pack	Close follower	Industry leader

Optional Comment_____

54. Which of the following best describes **your superior** prevailing thinking about funds the organisation spends on IT?

1	2	3	4	5
Views IT as an expense to be controlled		Views IT as a resource to be allocated fairly across organisational units		Views IT as a strategic investment

Optional Comment_____

55. How often does **your superior** endorse major IT investments that have not been endorsed by traditional justification criteria and procedures?

1	2	3	4	5
Rarely		Occasionally		Frequently

Optional Comment_____

56. Which of the following describes **your superior's** role in the IT steering committee?

1	2	3	4	5
Steering committee exists officially, but not active	IT committee exists, but with his/ her minimal input or awareness	Is a member of the IT steering committee	Chairs an IT committee and actively participate in meetings	Is the defacto steering committee

Optional Comment_____

57. What is **your superior's** vision for IT?

1	2	3	4
No stated vision expressed for IT	A functional vision of how the organisation will use IT	A technical vision of how the organisation will use IT	A strong but generic vision

58. Does **your superior** personally use IT?

1	2	3	4
He/ she has no personal involvement with computers	Not a user of IT but insists that his or her office make use of IT	Makes symbolic use of IT (e.g. PC in the office, but only occasional use)	Makes heavy use of IT via electronic mail, personal computer, executive information system.

SECTION B: Measuring Your Superior's 'Executive Leadership Roles'

Listed below are some statements that describe top management roles and behaviours. Please use the following scale to indicate how often your superior engage in these activities. Place a number from 1 to 6 in the space just after each of the items.

1.	2.	3.	4.	5.	6.
Very infrequently		Occasionally		Very frequently	NA

59. In his/her job as Head of Department, My superior:

a. Concentrates on our organisation's basic purpose and general direction.	
b. Nurtures contacts with people external to the organisation.	
c. Tries to create a sense of excitement within the organisation.	
d. Emphasises important organisational values through ceremonies and other events.	
e. Uses his/her position to influence decisions made at lower levels.	
f. Contributes specific knowledge and opinions about problems.	
g. Makes trade-off decisions and allocate resources accordingly.	
h. Focuses on results - "getting the job done today."	
i. Communicates a sense of where the organisation might be in 20 years.	
j. Studies emerging social and economic trends.	
k. Challenges our people with new goals and aspirations.	
l. Short-circuits the hierarchy by talking to people throughout the organisation.	
m. Asks questions which force subordinates to think about problems in new ways.	
n. Evaluates critically proposed projects and programs.	
o. Works to integrate conflicting perspectives and unpopular views.	
p. Sets specific, operational targets for our organisation.	

60. Please check one or combination of the following types of leadership roles that best describe your superior behaviour in your organisation.

( ) Type 1:
The Vision Setter role is one of creating a sense of identity and mission- defining and articulating the firm's basic purpose and future direction. Top managers spend considerable time monitoring and studying emerging social, economic, and technological trends. They also analyse competitors and markets. They sense emerging trends and pick up "weak signals" through informal contacts, both external and internal. The future directions of the organisation are based on a mix of disciplined analysis and intuition.

( ) Type 2:
The Motivator role is fundamentally one of managing meaning. It involves translating the vision and economic strategy of the firm into a "cause worth fighting for" - a core set of concepts and priorities that infuse and mobilise the entire organisation. The executive creates a sense of excitement and vitality within the organisation. Though innovative structures, programs, and processes, the top manager challenge people to gain new competencies and achieve higher levels of performance. However, they also provide a sense of performance and clarity of purpose. Through personal example, metaphor, anecdote, ceremony, and symbol, the executive emphasises enduring organisational values.

( ) Type 3:
In the Analyser role, top manager focuses on the efficient management of the internal operating system for serving existing services or activities. The executive leaders stop short of making day-to-day management decisions - this is the role of divisional and functional managers. Instead, the top manager sets the context and shapes the decisions made by the operating system. This is accomplished through the critical review and evaluation of proposed projects and programs - by asking difficult questions that force functional managers to think about their situation in new ways. The executive leaders also can integrate conflicting functional perspective for total organisation.

( ) Type 4:
In the role of Task Master, the top manager is concerned about organisation performance and results. In the narrowest sense, this translates into economic performance. In the broader sense, this translates into social performance - serving the full range of external "stakeholders" associated with the organisation.(e.g., politicians etc.) The executives not only influence the decision made at lower levels by contributing specific knowledge and opinions but also make explicit trade-off decisions and allocate resources to the highest priority activities. Task Master is a "hands-on" role with a strong focus on results - getting the job done today.

Appendix 4.4

The Results of Frequency Analysis.

EXECUTIVE LEADERSHIP ROLES:

AN Analyser

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
low	1	1	1.5	1.7	1.7
average	2	6	8.8	10.0	11.7
high	3	53	77.9	88.3	100.0
	.	8	11.8	Missing	
	Total	68	100.0	100.0	

Valid cases 60 Missing cases 8

MV Motivator

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
low	1	6	8.8	9.4	9.4
average	2	6	8.8	9.4	18.8
high	3	52	76.5	81.3	100.0
	.	4	5.9	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4

M adj Master

a e Lal l	Value	Frequency	Percent	Valid Percent	Cum Percent
av ra j	2	4	5.9	6.6	6.6
j1	3	57	83.8	93.4	100.0
	.	7	1 .3	Missing	
.	T tal	68	1 .	1 .0	

ali l cas . 61 Missing cases 7

VS Vis l Setter

Value Lal el	Value	Frequen y	Percent	Valid Percent	um Per ent
l w	1	1	1.5	1.9	1.9
average	2	1	14.7	18.9	2 .8
high	3	42	61.8	79.2	10 .0
	.	15	22.1	Missing	
	T tal	68	1 .	1 .0	

Vali l cases 3 Missing cases 15

CBIS PERFORMANCE:

QR53 Progressive Use of IT

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
below average	1	12	17.6	17.6	17.6
average	2	34	50.0	50.0	67.6
above average	3	22	32.4	32.4	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

QMIS MIS Success

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
average	2	22	32.4	34.9	34.9
above average	3	41	60.3	65.1	100.0
	.	5	7.4	Missing	
	Total	68	100.0	100.0	

Valid cases 63 Missing cases 5

EXECUTIVE SUPPORT:

RP1 exec. participation

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
low	1.00	11	16.2	16.2	16.2
average	2.00	30	44.1	44.1	60.3
high	3.00	27	39.7	39.7	100.0
.	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

RI1 exec. involvement

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
low	1.00	10	14.7	15.6	15.6
average	2.00	28	41.2	43.8	59.4
high	3.00	26	38.2	40.6	100.0
	.	4	5.9	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4

IS PRACTITIONERS' COMMITMENT:

C45T job satisfaction

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not happy	n	42	61.8	61.8	61.8
no response	x	5	7.4	7.4	69.1
like the job	y	21	30.9	30.9	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

C46T Exec. working relationship

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
bad r'ship	n	45	66.2	66.2	66.2
no response	x	9	13.2	13.2	79.4
good r'ship	y	14	20.6	20.6	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

Appendix 4.5

Procedures in Factor Analysis

1. Steps in Factor Analysis

Factor analysis usually proceeds in three steps:

- The first step was to determine the provisional factor solutions by carrying out the principal component analysis.

- The second step was called factor rotation, where the provisional factors were transformed to find new factors that were easier to interpret.

- The third step involves calculating the factor scores. These factor scores were then used as input to other multivariate analysis. In this study, factor scores were used as inputs or variables to the crosstabulation analysis.

2. Factor Solutions

The first step in the analysis was to produce linear combinations of components that were relevant to the variables being investigated. The variables for examination included the components of the IS practitioners' Job Satisfaction variables, IS Practitioners-Supervisor Relationship, and Senior Executives' Support variables. By this method of principle component analysis is designed to maximise the relevance of the linear combinations of components that are appropriate to the variables under examination. This relevance, or correlation, between the variables can be calculated so that the major independent variables can be judged. These variables are the most relevance to the analysis and, generally, account for most of the variation in the data.

They tend to provide the best-fit solutions to the data collected from the survey questionnaire.

Linear combinations of components are, in some ways like linear equations. Linear equations can be solved by various methods included by means of row and column operations on the matrix form of those equations. Matrix manipulations, however, have a broader application, and matrix arithmetic can be applied to tables of data, or to components that are not discretely defined, but exist, and have values between two limits.

In particular, matrix analysis can be applied to the solution of quadratic equations, which occur in statistical analysis as variances. By repeated iterations, the correlation between data sets or between components within particular arrays can be established. More specifically, a range of correlation can be established, and ranked according to show which variables are most relevance and account for most of the variance in the data under investigation.

Table 1 (a): IS practitioners' Job Satisfaction

t t l f t analysis l, Prin ipal mp nei ts Analysis PC

n t Stati tic :

Variab	mmunality	*	Fact r	Eigenvalue	Pct f Var	um Pct
.4 A	1.	*	1	3.414	34.1	34.1
.4 D	1.	*	2	1.51644	15.2	49.3
.45GR	1.	*	3	1. 9 9	10.9	60.2
.4 IR	1.	*	4	.91556	9.2	69.4
.4 JR	1.	*	5	.73749	7.4	76.7
.4 K	1.	*	6	.715 0	7.1	83.9
.4 L	1.	*	7	.5473	5.5	89.4
.4 MR	1. 0	*	8	.4 968	4.1	93.5
.45N	1.	*	9	.339 2	3.4	96.9
.45	1.	*	1	.31461	3.1	100.0

P evtra ted 3 fact rs.

Table 1 (b): IS Practitioners/ Superior Relationship

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
Q46A	1.00000	*	1	4.97136	33.1	33.1
Q46B	1.00000	*	2	1.80851	12.1	45.2
Q46C	1.00000	*	3	1.26984	8.5	53.7
Q46D	1.00000	*	4	1.11208	7.4	61.1
Q46FR	1.00000	*	5	.98247	6.5	67.6
Q46GR	1.00000	*	6	.90419	6.0	73.7
Q46H	1.00000	*	7	.77508	5.2	78.8
Q46IR	1.00000	*	8	.72240	4.8	83.6
Q46J	1.00000	*	9	.64441	4.3	87.9
Q46K	1.00000	*	10	.47965	3.2	91.1
Q46LR	1.00000	*	11	.34642	2.3	93.4
Q46MR	1.00000	*	12	.31144	2.1	95.5
Q46N	1.00000	*	13	.24030	1.6	97.1
Q46P	1.00000	*	14	.22076	1.5	98.6
Q46QR	1.00000	*	15	.21112	1.4	100.0

PC extracted 4 factors.

Table 1 (c): Senior Executives' Support

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
Q49	1.00000	*	1	2.01504	40.3	40.3
Q50	1.00000	*	2	1.28944	25.8	66.1
Q55	1.00000	*	3	.72613	14.5	80.6
Q56	1.00000	*	4	.64809	13.0	93.6
Q57	1.00000	*	5	.32131	6.4	100.0

PC extracted 2 factors.

This ranking is made according to a coefficient which has a "special" (German - "eigen") significance in this type of matrix analysis. In this form of analysis, the variable that accounted for most of the variance has the largest eigenvalue. In this way

the variables can be ranked according to their relevance. Strictly, in this type of analysis, the variables should be regarded as sets of data, and may not be found to show a meaningful correlation to actual variables. Theoretically there should be as many as factors as variables, although the degree of variance explained by successive factors becomes smaller and smaller (Bryman and Cramer, 1990; Manly, 1986).

The aim of factor analysis is to reduce the number of variables and retain important variables for further analysis. The results of the factor analysis of the survey data, using SPSS/ WINDOWS is shown in Tables 1 (a), (b), and (c). The eigenvalues give a weighting to the various factors involved. In Table 1 (a), for example, the eigenvalue associated with the first factor is 3.41400. It indicates that 34.1% of the total variance is accounted for by this factor.

Eigenvalues are particularly useful in complex situations, because the total of the eigenvalues equals the total number of factors being researched. The percentage variances can be quickly calculated by dividing the eigenvalue by the total number of factors, and expressing the result as a percentage.

In Table 1 (a), the total number of factors is 10, and the first factor eigenvalue is 3.414, giving an explained variance of 34.1%, more than twice that of the second factor considered. The footnote in Table 1 (a) recommends that 3 factors are retained for further analysis. This recommendation by SPSS follows the "Kaiser method" of selecting and retaining factors that have eigenvalues greater than 1. A second selection method is sometimes used based on the graphical "scree test". Because eigenvalues decrease according to the importance of the factors under consideration, such graphs begin to level off as successive eigenvalues become less relevant. At the point, the less relevant eigenvalues are discarded, and only those that occur, before the levelling off

takes place, are considered for further analysis (Cattell, 1966).

As a first stage, the "Kaiser method" was used to extract relevant factors, and these were examined to establish the level of overall variance accounted for. When this was done, it was found that four of the factors retained accounted for 60.2% of the variance. This figure is slightly higher than the 60% minimum percentage recommended by Lewis (1984).

The next step in the analysis is to determine how well the variables that make up the factors correlate to the factors themselves. The level of correlation that is established determines the effectiveness of the factor analysis, and how well "loaded" the factors are in terms of containing relevant variables. Mathematically, this is achieved by matrix manipulation of rows and columns using the technique of varimax rotation.

3. Factor Rotation

The objective of factor rotation is to determine how the variables relate to each of the factors, and the extent to which they correlate. Ideally, one set of variables would show a relevant correlation to one particular factor, although in practice a variable may correlate to more than one of the factors being investigated. The acceptable level of meaningful correlation is judgmental, and the factor loadings need to be examined in relation to a defined cut-off point, below which, the less significant variables can be filtered out of the analysis.

Table 2 (a): IS practitioners' Job Satisfaction - Before Rotation

```
- - - - - - - - - - -  F A C T O R  A N A L Y S I S  - - - - - - - - - - -

Fact r Matrix:

              Factor  1      Factor  2      Factor  3

ζ45JR           .73784
ζ4 L            .72564
ζ45GR           .64 31        -.5 997
ζ45IR           .6 483
ζ45A            .6  83         .41858
ζ4 N            .6  06                     -.45687
ζ45MR           .56211        -.55771
ζ45D            .52642                      .41068

ζ4 K            .45636         .6  94

ζ45                                         .78575
```

Table 2 (b): IS Practitioners/ Superior Relationship - Before Rotation

```
- - - - - - - - - - -  F A  T  P  A N A L Y S I S  - - - - - - - - - - -

  t r M trix:

              Fa t r  1      Fa t r  2      Fact r  3      Fact r  4

ζ46N            .  4 2
ζ 6CR           . 1116
ζ46             .  4 9
ζ46             .696 4        -.4 1
ζ46MP           .6 93
ζ46ł            . 9896         . ⌣ 65
ζ46             .  88         .48 42
ζ46LP           . 6 8                       .55549
ζ46            -. 6 6         .4   3        .4 324
ζ46             . 46 9
ζ46             .  9 4
ζ4              .  4
ζ46             .419 1

ζ4                                          .54514
ζ4 '                           .4  84                      .74397
```

Table 2 (c): Senior Executives' Support - Before Rotation

```
- - - - - - - - - - -  F A C T O R  A N A L Y S I S  - - - - - - - - - - -

  ⁻t r Matιix:

                Fact r  1      Fact r  ∠

ζ49               .7 931        -.531 8
ζ                 .(C257        -.62644
ζ5                .(3434
ζ                 .59595         .44796
ζ (               .56158         .54153
```

By successive iterations, variables that show cross-relationships to different variables can be sifted into appropriate categories. The aim is to relate one group of

variables to one, and only one factor. This results in output that is more understandable. In the previous part of the analysis, it was found that four factors accounted for 60.2% of the variance. These were retained as input to the factor rotation analysis. The factor analyses, before rotation, are shown in Tables 2 (a), (b), and (c).

It can be seen that, for example, in Table 2 (a), the variables shown loaded heavily on Factor 1, although some variables also loaded onto Factors 2 and 3. Several researchers (Manly, 1986; Lewis, 1984; Green, 1978; Child, 1970) have suggested a cut-off point of greater than or equal to 0.4 for the calculated values of factor loadings. Variables that show a loading of 0.4 or greater are retained, and variables that show a loading below 0.4 are omitted from any further analysis.

This may still not produce an ideal solution that groups a set of variables by one, and only one factor. A particular variable may show a loading of 0.4 or higher in relation to more than one factor. In such cases, it has been suggested that such variables are omitted (Bryman and Cramer, 1990, p. 263). Further, iterations can be done in such cases, where the variables have been omitted, to isolate a group of variables that relate to a single factor. the variables that have been omitted can be studied separately and also in relation to the final result of the analysis. In this way, factor rotation relates variables to factors in a clear and statistically meaningful way. Table 3 (a), (b), and (c) show the variables and factors that account for this variance by discrete factors. The final stage of the analysis is to compute the factor scores.

Table 3 (a): IS practitioners' Job Satisfaction - After Rotation

```
VARIMAX   rotation   1 for extraction   1 in analysis  1 - Kaiser Normalization.


VARIMAX c nverged in 5 iterations.


R tated Fa tor Matrix:


             Fact r  1     Factor  2     Factor  3

Q45GR          .8 345
Q4 MR          .8  66
Q4 JR          .73818
Q4 IR          .64195

Q4 K                         .76973
Q4 N                         .76788
Q4 A                         .67185
Q4                           .58 3

Q4                                      .8238
Q4 D                                    .578 7
```

Table 3 (b): IS Practitioners/ Superior Relationship - After Rotation

```
AR  r     ı tati n   1 f ı extıa ti n   1 ın analysis  1 - Kaiser Normalizati n.


VARIMAX c nverged in   iterati ns.


  tat  l  a-t ı Matıix:


              Fact ı  1     Fact r  2     Fact r  3     Fact r  4

Q4  R           . _ 54
Q46 R           .80  4
Q46B           -.724 4
Q46IR           .67_ 6
Q46QR           .61 97

Q46K                         .78393
Q46P                         .72338
Q46N                         .72_53
Q46D                         .59 02
Q46H                         .56225
Q46C                         .51804
Q46J                         .46669

Q46LR                                   .81471
Q46IR                                   .69523

Q46A                                                    .89342
```

Table 3 (c): Senior Executives' Support - After Rotation

```
VARIMAX   ı tation   1 for extraction   1 in analysis  1 - Kaiser Normalization.

VARIMAX converged in 3 iterations.

R tate I Factor Matrix:

              Fact ı  1      Fact r  2

ζ 6             .78 12
ζ5              .74 7
ζ               .69976

ζ                              .91 45
ζ49                            .87338
```

4. Computation of Factor Scores

The objective of the final stage of the analysis is to test the uniqueness of the factors. Variables having similar correlation characteristics were grouped together to provide mutually exclusive groupings of variables. This analysis provides dimensions of interactions and inter-relationships, each dimension having a quality that is different from and not a part of another dimension. This analysis also provides a measure of the variance explained or relative weighting and importance of these dimensions.

There are numerous ways and methods available to compute factor scores such as varimax orthogonal rotation, regression analyses, Barlett and Anderson - Rubin. In this study, the factor scores were computed using the varimax orthogonal rotation methods, to ensure that dimensional groupings of variables were orthogonal or mutually exclusive.

Table 4 (a): IS practitioners' Job Satisfaction - Factor Scores

Factors description and variables (loading >0.4)			loading	% of Variance explained
F1	Negative perception			34.1
	Q45GR	Frustrating	.80345	
	Q45MR	Tiresome	.80066	
	Q45JR	Boring	.73818	
	Q45IR	Routine	.64195	
F2	Positive perception			15.2
	Q45K	Creative	.76973	
	Q45N	Challenging	.76788	
	Q45A	Fascinating	.67185	
	Q45L	Pleasant	.58030	
F3	Moderate perception			10.9
	Q45O	Simple	.82380	
	Q45D	Respected	.57807	

Table 4 (b): IS Practitioners/ Superior Relationship - Factor Scores

Factors description and variables (loading >0.4)			loading	% of Variance explained
F1	Negative relationship			33.1
	Q46GR	Bad	.82054	
	Q46FR	Stubborn	.80724	
	Q46B	Impolite	-.72474	
	Q46MR	Annoying	.67286	
	Q46QR	Lazy	.61797	
F2	Positive relationship			12.1
	Q46K	Influential	.78393	
	Q46P	Intelligent	.72338	
	Q46N	Knows job well	.72253	
	Q46D	Up-to-date	.59002	
	Q46H	Around when needed	.56225	
	Q46C	Tactful	.51804	
	Q46J	Praises good work	.46669	
F3	Negative relationship			8.5
	Q46LR	Doesn't supervise enough	.81471	
	Q46IR	Hard to please	.69253	
F4	Positive relationship			7.4
	Q46A	Asks my advice	.89342	

Table 4 (c): Senior Executives' Support - Factor Scores

Factors description and variables (loading >0.4)		loading	% of Variance explained
F1	Involvement		40.3
	Q56	.78012	
	Q57	.74070	
	Q55	.69976	
F2	Participation		25.8
	Q50	.91045	
	Q49	.87338	

The results of this process are summarised in Table 4. Table 4 (a) shows the characteristics of the IS practitioners' Job Satisfaction. Four of the original variables show a high loading to the first factor. The first factor grouping was labelled "negative perception" to reflect the survey questionnaire responses of "frustrating, tiresome, boring, and routine." the average loading factor for "negative perception" is higher than that of the "positive perception" or "moderate perception". This indicates that the IS practitioners' responses more definite in the area of "negative perception". The weightings of these characteristics indicate a polarisation of perception towards either negative or positive perceptions. Overall, the IS practitioner has negative perception of his role, with just four variables explaining 34.1% of the total variance.

Appendix 4.6

The Detailed Results of Crosstabulation Analysis.

File: Written by SPSS for Windows

Q41 organization structure by Q40 dp goals

Q40 Page 1 of 1

Q41	Count / Row Pct / Col Pct / Tot Pct	n	y	Row Total
n		7	10	17
no		41.2	58.8	25.0
		38.9	20.0	
		10.3	14.7	
x		1	1	2
no response		50.0	50.0	2.9
		5.6	2.0	
		1.5	1.5	
y		10	39	49
yes		20.4	79.6	72.1
		55.6	78.0	
		14.7	57.4	
Column Total		18	50	68
		26.5	73.5	100.0

Number of Missing Observations: 0

File: Written by SPSS for Windows

Q41 organization structure by Q42R support mechanism

Q42R Page 1 of 1

Q41	Count / Row Pct / Col Pct / Tot Pct	no	no response	yes	Row Total
		n	x	y	
no	n	5	1	11	17
		29.4	5.9	64.7	25.0
		35.7	33.3	21.6	
		7.4	1.5	16.2	
no response	x	1	1		2
		50.0	50.0		2.9
		7.1	33.3		
		1.5	1.5		
yes	y	8	1	40	49
		16.3	2.0	81.6	72.1
		57.1	33.3	78.4	
		11.8	1.5	58.8	
	Column Total	14	3	51	68
		20.6	4.4	75.0	100.0

Number of Missing Observations: 0

File: Written by SPSS for Windows

Q41 organization structure by Q43 communication

Q43 Page 1 of 1

Q41	Count / Row Pct / Col Pct / Tot Pct	n	y	Row Total
no	n	9	8	17
		52.9	47.1	25.0
		23.7	26.7	
		13.2	11.8	
no response	x	1	1	2
		50.0	50.0	2.9
		2.6	3.3	
		1.5	1.5	
yes	y	28	21	49
		57.1	42.9	72.1
		73.7	70.0	
		41.2	30.9	
	Column Total	38	30	68
		55.9	44.1	100.0

Number of Missing Observations: 0

File: Written by SPSS for Windows

C45T job satisfaction by C46T Exec. working relationship

Page 1 of 1

C45T	Count / Row Pct / Col Pct / Tot Pct	C46T poor n	not sure x	good y	Row Total
n not happy		29 69.0 64.4 42.6	4 9.5 44.4 5.9	9 21.4 64.3 13.2	42 61.8
x no response			4 80.0 44.4 5.9	1 20.0 7.1 1.5	5 7.4
y like the job		16 76.2 35.6 23.5	1 4.8 11.1 1.5	4 19.0 28.6 5.9	21 30.9
	Column Total	45 66.2	9 13.2	14 20.6	68 100.0

Number of Missing Observations: 0

File: Written by SPSS for Windows

CAN Analyser by RI1 exec. involvement

CAN	Count / Row Pct / Col Pct / Tot Pct	RI1 low 1	average 2	high 3	Row Total
	1	1	1	1	3
		33.3	33.3	33.3	5.3
		14.3	4.0	4.0	
		1.8	1.8	1.8	
	2	1	6		7
		14.3	85.7		12.3
		14.3	24.0		
		1.8	10.5		
	3	5	18	24	47
		10.6	38.3	51.1	82.5
		71.4	72.0	96.0	
		8.8	31.6	42.1	
	Column Total	7	25	25	57
		12.3	43.9	43.9	100.0

Chi-Square	Value	DF	Significance
Pearson	8.11415	4	.08749
Likelihood Ratio	10.22469	4	.03681
Mantel-Haenszel test for linear association	3.45889	1	.06291

Minimum Expected Frequency - .368
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.27750	.10837	2.29664	
Kendall's Tau-c	.17729	.07719	2.29664	

Number of Missing Observations: 11

File: Written by SPSS for Windows

CAN Analyser by RP1 exec. participation

RP1 Page 1 of 1

CAN	Count / Row Pct / Col Pct / Tot Pct	low 1	average 2	high 3	Row Total
1		1 33.3 14.3 1.6	1 33.3 3.4 1.6	1 33.3 4.0 1.6	3 4.9
2		3 42.9 42.9 4.9	3 42.9 10.3 4.9	1 14.3 4.0 1.6	7 11.5
3		3 5.9 42.9 4.9	25 49.0 86.2 41.0	23 45.1 92.0 37.7	51 83.6
Column Total		7 11.5	29 47.5	25 41.0	61 100.0

Chi-Square	Value	DF	Significance
Pearson	10.30072	4	.03566
Likelihood Ratio	8.10784	4	.08771
Mantel-Haenszel test for linear association	4.71804	1	.02985

Minimum Expected Frequency - .344
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.27701	.12397	2.00852	
Kendall's Tau-c	.17092	.08510	2.00852	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CAN Analyser by QMIS MIS Success

QMIS Page 1 of 1

CAN	Count / Row Pct / Col Pct / Tot Pct	average 2	above average 3	Row Total
	1		3 100.0 7.9 5.3	3 5.3
	2	1 16.7 5.3 1.8	5 83.3 13.2 8.8	6 10.5
	3	18 37.5 94.7 31.6	30 62.5 78.9 52.6	48 84.2
	Column Total	19 33.3	38 66.7	57 100.0

Chi-Square	Value	DF	Significance
Pearson	2.62500	2	.26915
Likelihood Ratio	3.64581	2	.16156
Mantel-Haenszel test for linear association	2.57143	1	.10881

Minimum Expected Frequency - 1.000
Cells with Expected Frequency < 5 - 4 OF 6 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.20526	.09323	-1.93570	
Kendall's Tau-c	-.14404	.07441	-1.93570	

Number of Missing Observations: 11

File: Written by SPSS for Windows

CAN Analyser by QR53 Progressive Use of IT

QR53 Page 1 of 1

CAN	Count / Row Pct / Col Pct / Tot Pct	below average 1	average 2	above average 3	Row Total
1		1 33.3 10.0 1.6	2 66.7 6.7 3.3		3 4.9
2		2 28.6 20.0 3.3	2 28.6 6.7 3.3	3 42.9 14.3 4.9	7 11.5
3		7 13.7 70.0 11.5	26 51.0 86.7 42.6	18 35.3 85.7 29.5	51 83.6
	Column Total	10 16.4	30 49.2	21 34.4	61 100.0

Chi-Square	Value	DF	Significance
Pearson	3.39296	4	.49434
Likelihood Ratio	4.27908	4	.36955
Mantel-Haenszel test for linear association	1.42496	1	.23259

Minimum Expected Frequency - .492
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.10796	.12549	.84138	
Kendall's Tau-c	.06772	.08049	.84138	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CAN Analyser by C45T work description

C45T Page 1 of 1

CAN	Count / Row Pct / Col Pct / Tot Pct	not happy n	x	like the job y	Row Total
	1	3 100.0 7.7 4.9			3 4.9
	2	2 28.6 5.1 3.3		5 71.4 26.3 8.2	7 11.5
	3	34 66.7 87.2 55.7	3 5.9 100.0 4.9	14 27.5 73.7 23.0	51 83.6
	Column Total	39 63.9	3 4.9	19 31.1	61 100.0

Chi-Square	Value	DF	Significance
Pearson	7.43197	4	.11475
Likelihood Ratio	8.14425	4	.08643

Minimum Expected Frequency - .148
Cells with Expected Frequency < 5 - 7 OF 9 (77.8%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.12194	.13117	-.92000	
Kendall's Tau-c	-.06853	.07449	-.92000	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CAN Analyser by C46T working relationship

C46T Page 1 of 1

CAN	Count / Row Pct / Col Pct / Tot Pct	bad r'ship	no response	good r'ship	Row Total
1		2 66.7 4.9 3.3		1 33.3 7.1 1.6	3 4.9
2		5 71.4 12.2 8.2	1 14.3 16.7 1.6	1 14.3 7.1 1.6	7 11.5
3		34 66.7 82.9 55.7	5 9.8 83.3 8.2	12 23.5 85.7 19.7	51 83.6
Column Total		41 67.2	6 9.8	14 23.0	61 100.0

Chi-Square	Value	DF	Significance
Pearson	.83430	4	.93379
Likelihood Ratio	1.12997	4	.88949

Minimum Expected Frequency - .295
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.02454	.12082	.20294	
Kendall's Tau-c	.01371	.06754	.20294	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CMV Motivator by RI1 exec. involvement

CMV	Count / Row Pct / Col Pct / Tot Pct	RI1 low 1	average 2	high 3	Row Total
1		1 100.0 12.5 1.8			1 1.8
2		5 33.3 62.5 8.9	9 60.0 36.0 16.1	1 6.7 4.3 1.8	15 26.8
3		2 5.0 25.0 3.6	16 40.0 64.0 28.6	22 55.0 95.7 39.3	40 71.4
Column Total		8 14.3	25 44.6	23 41.1	56 100.0

Chi-Square	Value	DF	Significance
Pearson	19.42186	4	.00065
Likelihood Ratio	19.18565	4	.00072
Mantel-Haenszel test for linear association	16.40482	1	.00005

Minimum Expected Frequency - .143
Cells with Expected Frequency < 5 - 4 OF 9 (44.4%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.50470	.09030	4.49938	
Kendall's Tau-c	.38265	.08505	4.49938	

Number of Missing Observations: 12

File: Written by SPSS for Windows

CMV Motivator by RP1 exec. participation

RP1 Page 1 of 1

CMV	Count / Row Pct / Col Pct / Tot Pct	low 1	average 2	high 3	Row Total
1		1 100.0 12.5 1.7			1 1.7
2		4 25.0 50.0 6.7	8 50.0 29.6 13.3	4 25.0 16.0 6.7	16 26.7
3		3 7.0 37.5 5.0	19 44.2 70.4 31.7	21 48.8 84.0 35.0	43 71.7
Column Total		8 13.3	27 45.0	25 41.7	60 100.0

Chi-Square	Value	DF	Significance
Pearson	11.12894	4	.02515
Likelihood Ratio	8.74732	4	.06774
Mantel-Haenszel test for linear association	7.22809	1	.00718

Minimum Expected Frequency - .133
Cells with Expected Frequency < 5 - 4 OF 9 (44.4%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.29687	.11845	2.35344	
Kendall's Tau-c	.22333	.09490	2.35344	

Number of Missing Observations: 8

File: Written by SPSS for Windows

CMV Motivator by QMIS MIS Success

Page 1 of 1

CMV	Count / Row Pct / Col Pct / Tot Pct	QMIS average 2	QMIS above average 3	Row Total
1			1 100.0 2.7 1.8	1 1.8
2		5 31.3 26.3 8.9	11 68.8 29.7 19.6	16 28.6
3		14 35.9 73.7 25.0	25 64.1 67.6 44.6	39 69.6
	Column Total	19 33.9	37 66.1	56 100.0

Chi-Square	Value	DF	Significance
Pearson	.63216	2	.72900
Likelihood Ratio	.94761	2	.62263
Mantel-Haenszel test for linear association	.37781	1	.53878

Minimum Expected Frequency - .339
Cells with Expected Frequency < 5 - 2 OF 6 (33.3%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.06948	.12791	-.54095	
Kendall's Tau-c	-.06122	.11318	-.54095	

Number of Missing Observations: 12

File: Written by SPSS for Windows

CMV Motivator by QR53 Progressive Use of IT

Page 1 of 1

CMV	Count / Row Pct / Col Pct / Tot Pct	QR53 below average 1	QR53 average 2	QR53 above average 3	Row Total
1		1 100.0 10.0 1.7			1 1.7
2		5 31.3 50.0 8.3	8 50.0 25.8 13.3	3 18.8 15.8 5.0	16 26.7
3		4 9.3 40.0 6.7	23 53.5 74.2 38.3	16 37.2 84.2 26.7	43 71.7
	Column Total	10 16.7	31 51.7	19 31.7	60 100.0

Chi-Square	Value	DF	Significance
Pearson	9.73725	4	.04509
Likelihood Ratio	8.29075	4	.08149
Mantel-Haenszel test for linear association	6.56075	1	.01043

Minimum Expected Frequency - .167
Cells with Expected Frequency < 5 - 4 OF 9 (44.4%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.28827	.11790	2.29762	
Kendall's Tau-c	.21667	.09430	2.29762	

Number of Missing Observations: 8

File: Written by SPSS for Windows

CMV Motivator by C45T work description

CMV	Count / Row Pct / Col Pct / Tot Pct	C45T: not happy	x	like the job	Row Total
		n		y	
1				1	1
				100.0	1.7
				5.6	
				1.7	
2		10	1	5	16
		62.5	6.3	31.3	26.7
		25.0	50.0	27.8	
		16.7	1.7	8.3	
3		30	1	12	43
		69.8	2.3	27.9	71.7
		75.0	50.0	66.7	
		50.0	1.7	20.0	
	Column Total	40	2	18	60
		66.7	3.3	30.0	100.0

Chi-Square	Value	DF	Significance
Pearson	3.04748	4	.54991
Likelihood Ratio	3.05465	4	.54872

Minimum Expected Frequency - .033
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.10756	.13031	-.81692	
Kendall's Tau-c	-.07083	.08671	-.81692	

Number of Missing Observations: 8

File: Written by SPSS for Windows

CMV Motivator by C46T working relationship

CMV	Count / Row Pct / Col Pct / Tot Pct	C46T: bad r'ship n	C46T: no response x	C46T: good r's hip y	Row Total
1		1 100.0 2.4 1.7			1 1.7
2		14 87.5 33.3 23.3	2 12.5 33.3 3.3		16 26.7
3		27 62.8 64.3 45.0	4 9.3 66.7 6.7	12 27.9 100.0 20.0	43 71.7
Column Total		42 70.0	6 10.0	12 20.0	60 100.0

Page 1 of 1

Chi-Square	Value	DF	Significance
Pearson	6.11296	4	.19087
Likelihood Ratio	9.40168	4	.05181

Minimum Expected Frequency - .100
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.26956	.08537	2.78857	
Kendall's Tau-c	.17667	.06335	2.78857	

Number of Missing Observations: 8

File: Written by SPSS for Windows

CTM Task Master by RI1 exec. involvement

RI1 Page 1 of 1

CTM	Count / Row Pct / Col Pct / Tot Pct	low 1	average 2	high 3	Row Total
1		2 100.0 25.0 3.5			2 3.5
2		2 40.0 25.0 3.5	3 60.0 12.0 5.3		5 8.8
3		4 8.0 50.0 7.0	22 44.0 88.0 38.6	24 48.0 100.0 42.1	50 87.7
	Column Total	8 14.0	25 43.9	24 42.1	57 100.0

Chi-Square	Value	DF	Significance
Pearson	18.76440	4	.00087
Likelihood Ratio	15.85679	4	.00322
Mantel-Haenszel test for linear association	12.78117	1	.00035

Minimum Expected Frequency - .281
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.41834	.08776	2.85569	
Kendall's Tau-c	.23084	.08084	2.85569	

Number of Missing Observations: 11

File: Written by SPSS for Windows

CTM Task Master by RP1 exec. participation

RP1 Page 1 of 1

CTM	Count / Row Pct / Col Pct / Tot Pct	low 1	average 2	high 3	Row Total
1		1 50.0 10.0 1.6	1 50.0 3.8 1.6		2 3.3
2		3 60.0 30.0 4.9	2 40.0 7.7 3.3		5 8.2
3		6 11.1 60.0 9.8	23 42.6 88.5 37.7	25 46.3 100.0 41.0	54 88.5
	Column Total	10 16.4	26 42.6	25 41.0	61 100.0

Chi-Square	Value	DF	Significance
Pearson	11.37103	4	.02270
Likelihood Ratio	11.47475	4	.02172
Mantel-Haenszel test for linear association	8.54168	1	.00347

Minimum Expected Frequency - .328
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.36966	.08410	2.80860	
Kendall's Tau-c	.19995	.07119	2.80860	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CTM Task Master by QMIS MIS Success

QMIS Page 1 of 1

CTM	Count / Row Pct / Col Pct / Tot Pct	average 2	above average 3	Row Total
1			2 100.0 5.3 3.5	2 3.5
2		3 60.0 15.8 5.3	2 40.0 5.3 3.5	5 8.8
3		16 32.0 84.2 28.1	34 68.0 89.5 59.6	50 87.7
Column Total		19 33.3	38 66.7	57 100.0

Chi-Square	Value	DF	Significance
Pearson	2.64000	2	.26714
Likelihood Ratio	3.14555	2	.20747
Mantel-Haenszel test for linear association	.00000	1	1.00000

Minimum Expected Frequency - .667
Cells with Expected Frequency < 5 - 4 OF 6 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.06277	.13524	.46207	
Kendall's Tau-c	.03940	.08526	.46207	

Number of Missing Observations: 11

File: Written by SPSS for Windows

CTM Task Master by QR53 Progressive Use of IT

Page 1 of 1

CTM	Count / Row Pct / Col Pct / Tot Pct	QR53 below average 1	2	above average 3	Row Total
1		1 50.0 10.0 1.6		1 50.0 4.5 1.6	2 3.3
2		1 20.0 10.0 1.6	3 60.0 10.3 4.9	1 20.0 4.5 1.6	5 8.2
3		8 14.8 80.0 13.1	26 48.1 89.7 42.6	20 37.0 90.9 32.8	54 88.5
Column Total		10 16.4	29 47.5	22 36.1	61 100.0

Chi-Square	Value	DF	Significance
Pearson	3.09752	4	.54164
Likelihood Ratio	3.60169	4	.46259
Mantel-Haenszel test for linear association	.54365	1	.46092

Minimum Expected Frequency - .328
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.08990	.13120	.67276	
Kendall's Tau-c	.04837	.07190	.67276	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CTM Task Master by C45T work description

C45T Page 1 of 1

CTM	Count / Row Pct / Col Pct / Tot Pct	not happy n	x	like the job y	Row Total
	1	2 100.0 5.1 3.3			2 3.3
	2	3 60.0 7.7 4.9	1 20.0 25.0 1.6	1 20.0 5.6 1.6	5 8.2
	3	34 63.0 87.2 55.7	3 5.6 75.0 4.9	17 31.5 94.4 27.9	54 88.5
	Column Total	39 63.9	4 6.6	18 29.5	61 100.0

Chi-Square	Value	DF	Significance
Pearson	2.83325	4	.58611
Likelihood Ratio	3.02553	4	.55356

Minimum Expected Frequency - .131
Cells with Expected Frequency < 5 - 7 OF 9 (77.8%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.08324	.10543	.76696	
Kendall's Tau-c	.04031	.05256	.76696	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CTM Task Master by C46T working relationship

C46T Page 1 of 1

CTM	Count / Row Pct / Col Pct / Tot Pct	bad r'ship n	no response x	good r's hip y	Row Total
1		2 100.0 4.8 3.3			2 3.3
2		3 60.0 7.1 4.9	2 40.0 28.6 3.3		5 8.2
3		37 68.5 88.1 60.7	5 9.3 71.4 8.2	12 22.2 100.0 19.7	54 88.5
Column Total		42 68.9	7 11.5	12 19.7	61 100.0

Chi-Square	Value	DF	Significance
Pearson	5.90097	4	.20667
Likelihood Ratio	6.08153	4	.19314

Minimum Expected Frequency - .230
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.06667	.09716	.66803	
Kendall's Tau-c	.03144	.04707	.66803	

Number of Missing Observations: 7

File: Written by SPSS for Windows

CVS Vision Setter by RI1 exec. involvement

Page 1 of 1

CVS	RI1 low 1	average 2	high 3	Row Total
1		1	1	2
		50.0	50.0	3.9
		4.2	4.5	
		2.0	2.0	
2	3	5	2	10
	30.0	50.0	20.0	19.6
	60.0	20.8	9.1	
	5.9	9.8	3.9	
3	2	18	19	39
	5.1	46.2	48.7	76.5
	40.0	75.0	86.4	
	3.9	35.3	37.3	
Column Total	5 9.8	24 47.1	22 43.1	51 100.0

Chi-Square	Value	DF	Significance
Pearson	6.79941	4	.14688
Likelihood Ratio	5.99058	4	.19985
Mantel-Haenszel test for linear association	2.22581	1	.13572

Minimum Expected Frequency - .196
Cells with Expected Frequency < 5 - 7 OF 9 (77.8%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.23677	.13040	1.74733	
Kendall's Tau-c	.16609	.09505	1.74733	

Number of Missing Observations: 17

File: Written by SPSS for Windows

CVS Vision Setter by RP1 exec. participation

RP1 Page 1 of 1

CVS	Count / Row Pct / Col Pct / Tot Pct	low 1	average 2	high 3	Row Total
1			1 50.0 3.8 1.8	1 50.0 4.3 1.8	2 3.6
2		2 20.0 33.3 3.6	6 60.0 23.1 10.9	2 20.0 8.7 3.6	10 18.2
3		4 9.3 66.7 7.3	19 44.2 73.1 34.5	20 46.5 87.0 36.4	43 78.2
Column Total		6 10.9	26 47.3	23 41.8	55 100.0

Chi-Square	Value	DF	Significance
Pearson	2.90685	4	.57353
Likelihood Ratio	3.21890	4	.52188
Mantel-Haenszel test for linear association	.85320	1	.35565

Minimum Expected Frequency - .218
Cells with Expected Frequency < 5 - 7 OF 9 (77.8%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	.16342	.12222	1.31508	
Kendall's Tau-c	.11207	.08522	1.31508	

Number of Missing Observations: 13

File: Written by SPSS for Windows

CVS Vision Setter by QMIS MIS Success

QMIS Page 1 of 1

CVS	Count / Row Pct / Col Pct / Tot Pct	average 2	above average 3	Row Total
1		1 50.0 5.9 2.0	1 50.0 2.9 2.0	2 3.9
2		1 10.0 5.9 2.0	9 90.0 26.5 17.6	10 19.6
3		15 38.5 88.2 29.4	24 61.5 70.6 47.1	39 76.5
Column Total		17 33.3	34 66.7	51 100.0

Chi-Square	Value	DF	Significance
Pearson	3.16154	2	.20582
Likelihood Ratio	3.68048	2	.15878
Mantel-Haenszel test for linear association	.86565	1	.35216

Minimum Expected Frequency - .667
Cells with Expected Frequency < 5 - 3 OF 6 (50.0%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.17699	.12411	-1.39493	
Kendall's Tau-c	-.14456	.10363	-1.39493	

Number of Missing Observations: 17

File: Written by SPSS for Windows

CVS Vision Setter by QR53 Progressive Use of IT

CVS	Count / Row Pct / Col Pct / Tot Pct	QR53 below average 1	QR53 average 2	QR53 above average 3	Row Total
1		1 50.0 12.5 1.8		1 50.0 5.0 1.8	2 3.6
2			6 60.0 22.2 10.9	4 40.0 20.0 7.3	10 18.2
3		7 16.3 87.5 12.7	21 48.8 77.8 38.2	15 34.9 75.0 27.3	43 78.2
Column Total		8 14.5	27 49.1	20 36.4	55 100.0

Chi-Square	Value	DF	Significance
Pearson	4.66114	4	.32387
Likelihood Ratio	6.38926	4	.17190
Mantel-Haenszel test for linear association	.13173	1	.71664

Minimum Expected Frequency - .291
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.07421	.12951	-.57100	
Kendall's Tau-c	-.05157	.09032	-.57100	

Number of Missing Observations: 13

File: Written by SPSS for Windows

CVS Vision Setter by C45T work description

C45T Page 1 of 1

CVS	Count / Row Pct / Col Pct / Tot Pct	not happy n	x	like the job y	Row Total
1		1 50.0 2.7 1.8		1 50.0 6.3 1.8	2 3.6
2		5 50.0 13.5 9.1	1 10.0 50.0 1.8	4 40.0 25.0 7.3	10 18.2
3		31 72.1 83.8 56.4	1 2.3 50.0 1.8	11 25.6 68.8 20.0	43 78.2
	Column Total	37 67.3	2 3.6	16 29.1	55 100.0

Chi-Square	Value	DF	Significance
Pearson	2.96195	4	.56421
Likelihood Ratio	2.66143	4	.61598

Minimum Expected Frequency - .073
Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.17820	.13664	-1.26934	
Kendall's Tau-c	-.10810	.08516	-1.26934	

Number of Missing Observations: 13

File: Written by SPSS for Windows

CVS Vision Setter by C46T working relationship

C46T Page 1 of 1

CVS	Count / Row Pct / Col Pct / Tot Pct	bad r'ship n	no response x	good r's hip y	Row Total
1		1 50.0 2.6 1.8	1 50.0 14.3 1.8		2 3.6
2		6 60.0 15.4 10.9	2 20.0 28.6 3.6	2 20.0 22.2 3.6	10 18.2
3		32 74.4 82.1 58.2	4 9.3 57.1 7.3	7 16.3 77.8 12.7	43 78.2
	Column Total	39 70.9	7 12.7	9 16.4	55 100.0

Chi-Square	Value	DF	Significance
Pearson	3.76912	4	.43815
Likelihood Ratio	3.15504	4	.53222

Minimum Expected Frequency - .255
Cells with Expected Frequency < 5 - 5 OF 9 (55.6%)

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Kendall's Tau-b	-.11536	.13007	-.87681	
Kendall's Tau-c	-.06942	.07918	-.87681	

Number of Missing Observations: 13